WILDLIFE REVIEW

OHIO STATE UNIVERSITY
DEC 4 - 1959
LIBRARY

NUMBER 96 AUGUST 1959

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

WILDLIFE REVIEW

An abstracting service for wildlife management
Issued for the information of cooperators
by the Fish and Wildlife Service
United States Department of the Interior

August 1959 Patuxent Research Refuge, Laurel, Maryland No. 96

The printing of this publication has been approved
by the Director of the Bureau of the Budget, August 13, 1957.

CONTENTS

General conservation
Natural resources & climate 2
Soils 4
Conservation education 4
Bibliographies, directories, biography, history 5
Plants
General, ecology, techniques 6
Floras, communities, taxonomy ... 6
Forest surveys 8
Wildlife
New game series 9
Biotas, ecology, natural history 9
Natural areas & refuges 10
Nature protection & rare & extinct species 11
Morphology, physiology, behavior, migration 11
Effects of chemicals, weather, cars, etc. 12
Parasites & diseases 14
Populations & fluctuations 14
Biometrics 15
Techniques 15
Management & research, general .. 17
Hunting areas & problems 19
Food habits & techniques 19
Predation, crop damage, control 19
Reports of organizations & reports of harvests 20
Management & ecology of habitats & animals
Wetlands & wildlife 21
Farmland & wildlife 25
Rangeland & wildlife 25
Forestland
Forestry & ecology 27
Management for & damage by wildlife 28
Stripped land & misc. habitats 30
Control of upland vegetation with herbicides, etc. 30
Mammals
General 33
Faunas & manuals 34
Population, home ranges, communities 34
Parasites & diseases 35
Shrews, moles, bats 36
Rabbits & pikas 37
Rodents
Miscellaneous 40
Rattus & Mus 43
Sciurids 43
Beaver 44
Muskrat & nutria 45
Fur animals, general 46
Carnivores
Bears 46
Raccoon, ringtail, coati 47
Mustelids 47
Dogs, wolves, foxes 47
Cats 48
Big game
General 48
Deer (Odocoileus) 51
Marine 53
Birds
General 56
Morphology, physiology, behavior, migration 57
Manuals, faunas, communities ... 58
Populations & fluctuations 60
Economics, control, mortality .. 60
Quail 61
Pheasants 62
Grouse, partridge, etc. 63
Turkey 64
Doves & pigeons 64
Waterfowl 65
Cranes, rails, shorebirds 69
Other birds 70
Reptiles & amphibians 70
Fishes 75
Invertebrates 75

Author index 76

Kenneth J. Chiavetta, editor.

NATURAL RESOURCES & CLIMATE

Ackerman, Edward A., and George O. G. Löf. TECHNOLOGY IN AMERICAN WATER DEVELOPMENT. Published by Johns Hopkins U. Press, Balt. 18, Md., for Resources for the Future. xv + 710 p., 38 figs., 27 photos, 35 tables, map in endpocket. 1959. $10.00. [From review in Outdoor News Bul. 13(10) and publisher's announcement.]

Result of a 3-year staff study. "It reviews past and prospective changes in technology that bear upon water supply demand and management; and examines their impact upon administrative patterns and policy decisions. The book has four sections: I. The Physical and Economic Environment of Water Development; II. Techniques and Technical Events Significant in the Progress of Water Development; III. Emerging Technology of Potential Impact on Water Use; and IV. Organizational Responses to Problems and Opportunities for Water Development Introduced by Technologic Change. The emerging techniques described and evaluated include demineralization, weather modification, improved thermal generation of electricity, and industrial recycling." "In tracing past events that have influenced water development, discussing new technologies that promise still more influence on development and management of the nation's water resources, the authors have prepared a unique and monumental treatise. The vast store of information that is brought together should help inform businessmen, social scientists, administrators and lawyers with the complexities of water resources development and management. It acquaints engineers and physical scientists with the administrative problems and opportunities that stem from their works."

Barlowe, Raleigh. LAND RESOURCE ECONOMICS. Prentice-Hall, Inc., Englewood Cliffs, N. J. 585 p., illus. 1958. $10.00. [From review by Wm. H. Heneberry, J. Soil & Water Cons. 14(3).]

A useful book for professional conservationists. Among the many topics covered in the 18 chapters of this book are: the supply of and demand for land, economic returns to land, property values, development costs, effect of location on land use, property rights, credit, taxation, and land use planning. "A chapter on public measures for directing land use contains precise discussion of the influence of government powers such as eminent domain, police power, taxing and spending powers on land use. The chapter on conservation of land resources will attract the attention of everyone interested in this subject... A section on the effect of interest and discount rates helps to explain why some operators find it economic to maintain or build up their soil resources while others can justify gradual depletion of these resources."

Clawson, Marion. (Resources for the Future, 1145 19th St. NW., Wash. 6, D. C.) THE CRISIS IN OUTDOOR RECREATION. PART II. Am. For. 65(4): 28-35, 61-62, 20 figs. Apr. 1959.

Today's pressures on parks and forests are just a mild foretaste. By the year 2000, demands may be 4 times as great on local parks, 16 times on state parks, and 40 times on national parks. What can be done to cope with this situation? Local parks and playgrounds can be acquired and developed, if people are willing to pay the price, but such lands are being acquired at less than 1/5 the necessary rate. The intermediate areas, such as state parks, offer the best possibilities, for they need not have great inherent attraction, need not be on good land, and need not be costly. They just need to be set up for outdoor recreation. However, we will need about 70 million acres of them where we now have 9 million. On the national park and national forest level, where demand will be maximal, few outstanding areas can be added, and little increase in area is likely. National parks and the like can be seriously injured by overuse. More sites within parks and forests can be developed for public use, but there is a limit to how far this can and should go. All-year use can be encouraged, but this will not solve the problem. It may be necessary to limit admissions or to charge really large fees. Use of large private forests for recreation will help. So will farmer-sportsmen agreements, but neither will give large-scale relief. The best solution will lie in a well-coordinated approach to all public recreational land. That is, the total problem should be considered as much in thinking about local parks as national parks. The main line of action that seems feasible is to increase state and local parks and thereby relieve pressures on outstanding national areas.

Martin, Sylvan C. (US Dept. Health, Ed., & Welfare, N. Y. City.) A STATUS REPORT ON THE FEDERAL WATER SUPPLY AND WATER POLLUTION CONTROL PROGRAM. Trans. NE. Wildl. Conf. 1: 77-85. 1958 (1959).

McKean, Roland N. EFFICIENCY IN GOVERNMENT THROUGH SYSTEMS ANALYSIS, WITH EMPHASIS ON WATER RESOURCE DEVELOPMENT. John Wiley & Sons, 440 4th Ave., N. Y. 16, N. Y. 336 p. 1958. $8.00. [From review by L. G. Hines, J. Soil & Water Cons. 14(3).]

Like the books by Eckstein and Krutilla, and Eckstein, (see WR 93 p. 2), this is fundamentally a study of the economics of government water projects. "It is in the appraisal of particular federal water projects that these books make the greater contribution, rather than in the somewhat overly elaborate treatment of the nature of economic analysis and its significance for the water problem. McKean selects the Green River Watershed and the Santa Maria Project as case studies to review the benefit-cost procedures..." All 3 books are slanted toward the economist. "Because of its felicity of expression and somewhat superior general treatment of the subject, the McKean book is recommended over the other two." Working from the same assumptions, all 3 authors "are virtually unanimous in holding that the public development of water resources is economically justified only when the yield in consumer satisfaction is at least equivalent to that which would be obtained by developing a given sector of the private economy." Hines devotes a large part of his review to arguments against this and similar conclusions.

Renne, Roland G. LAND ECONOMICS. Harper & Bros., 49 E. 33d St., N. Y. 16, N. Y. 599 p., illus. Revised edition, 1958. $8.00. [From review by Wm. H. Heneberry, J. Soil & Water Cons. 14(3).]

An improved textbook. Its 23 chapters are grouped into 6 major parts. "Part I delineates the subject matter of land economics... A chapter on Land Problems, Policies and Programs outlines the problem areas of land economics, and presents a brief discussion of the objectives and history of land policies in the United States. Part II covers Principles of Land Utilization. This section includes chapters on the supply of and demand for land, the process of resource allocation, and land conservation. The chapter on land conservation is of special interest... The tendency of some farmers to sacrifice present income in order to preserve their soil resources for future generations should have received more attention. Part III, entitled Land Income and Value, contains chapters on land rent and income distribution, appraisal, credit, and taxation, Part IV deals with the general area of Property in Land. The institution and development of property rights in land are discussed, as well as the social control of land use, land tenure, and tenancy in both agricultural and non-agricultural land. Part V covers the Distinctive Features of Major Land Uses. There are chapters on agricultural land, non-agricultural (forest, recreational, mineral, transportation and urban land) and the relationship between land and water... Part VI, on Improvement of Land Use includes a chapter on land-use planning and one on land reform."

Various authors. HOW MUCH LAND FOR FOREST RECREATION? Proc. Soc. Am. For. Meeting 1958: 96-116. 1958 [1959].

The scores of problems and questions involved in considering needs and possibilities of forest recreation are discussed penetratingly by a panel consisting of Henry A. Harrison (U. S. Forest Service), James H. Tyndall (Cook Co., Illinois, Forest Preserve District), James P. Gilligan (U. of California, Berkeley), C. J. Olsen (Utah Parks & Recreation Comm., Ogden), and Lemuel A. Garrison (Natl. Park Service). Howard Zahniser (Wilderness Society, Washington, D. C.) has a long paper, The Case for Wilderness Preservation Legislation. Kenneth B. Pomeroy (Am. Forestry Assn., Washington, D. C.) discusses The National Outdoor Recreation Resources Review Commission. Frederick Billings (Weyerhaeuser Timber Co.) gives much information on Industrial Forestry and Public Recreation.

SOILS

Goldston, E. F., and others. SOIL SURVEY OF DUPLIN COUNTY, NORTH CAROLINA. US Soil Cons. Serv., Ser. 1954, no. 2. ii + 75 p., 10 figs. + single-fold maps based on aerial photos and bound in. Mar. 1959. Sold by Supt. Documents.

Jensen, E. R., and others. SOIL SURVEY OF TIFT COUNTY, GEORGIA. US Soil Cons. Serv., Ser. 1946, no. 3. i + 28 p., 16 figs. + single-fold maps based on aerial photos and bound in. Sold by Supt. Documents. Jan. 1959.

Leighty, W. J., and others. SOIL SURVEY OF THE DESCHUTES AREA, OREGON. US Soil Cons. Serv., Ser. 1945, no. 2. iii + 103 p., 6 figs. + colored 1-p. maps bound in. Dec. 1958. Sold by Supt. Documents.

Lytle, S. A., and others. SOIL SURVEY OF ST. MARY PARISH, LOUISIANA. US Soil Cons. Serv., Ser. 1952, no. 3. i + 45 p., 7 figs. + single-fold maps based on aerial photos and bound in. March 1959.

Mowery, Irvin C., and others. SOIL SURVEY OF CHEROKEE COUNTY, TEXAS. US Soil Cons. Serv., Ser. 1948, no. 6. ii + 65 p., 12 figs. + single-fold maps based on aerial photos and bound in. Mar. 1959. Sold by Supt. Documents.

Powell, J. C., and others. SOIL SURVEY OF SUNFLOWER COUNTY, MISSISSIPPI. US Soil Cons. Serv., Ser. 1952, no. 5. ii + 45 p., 12 figs. + single-fold maps based on aerial photos and bound in. Feb. 1959. Sold by Supt. Documents.

White, E. M., and others. SOIL SURVEY OF MONONA COUNTY, IOWA. US Soil Cons. Serv., Ser. 1952, no. 2. i + 41 p., 6 figs. + colored, single-fold maps bound in. Jan. 1959. Sold by Supt. Documents.

CONSERVATION EDUCATION

Arndt, Christian O., editor. COMMUNITY EDUCATION: PRINCIPLES AND PRACTICES FROM WORLD-WIDE EXPERIENCE. 58th Yearbook of Natl. Soc. for Study of Educ., Part I. 420 p. 1959. $4.00, cloth, $3.25, paper, from U. Chicago Press, Chicago, Ill. [From review in J. Soil & Water Cons. 14(3).]

Should be of help in persuading the public of the need of new lines of conservation action. "The book has much to offer to those engaged in education or teaching introduced techniques to help people to learn how to help themselves. Chapter X, 'Community Education in Southern Illinois,' by Richard W. Poston contains some valuable sociological lessons."

Niehuis, Charley C. STEEL DUST. Dodd, Mead & Co., 432 4th Ave., N. Y. 16, N. Y. xvi + 267 p. 1959. $3.00.

Niehuis is pioneering brilliantly in a new type of western fiction. STEEL DUST, like its predecessor, TRAPPING THE SILVER BEAVER, is as packed with action as any yarn of the six-gun school and is set in locales spectacular enough to stir any imagination. But Niehuis writes of today and much of the action centers around conservation conflicts. The hero is a 17-year-old boy and the book is intended mainly for teen-age boys, but it strikes us as suitable for males of any age from 10 until literary criticism sets in. The author makes proper range management and proper livestock use of national forests the core of his book and he shows no sympathy with grasping stockmen. The toughest and most powerful rancher and his ruthless foreman tangle with forest officials and state game men. The young hero is 100% a rancher and takes summer employment on fawn-tagging only for money. His opinions gradually change, of course, as he learns about range condition, erosion, and multiple use. But this part is not overemphasized and technicalities are no more than mentioned. Instead we have dogs and horses at their best, chases after fawns on Kaibab North, fights between men, a close escape from forest fire, trophy hunting for deer in the Grand Canyon, the struggle to save the home ranch, and the hunt for Steel Dust, the great quarterhorse gone wild in some of the most incredible portions of the Grand Canyon. Niehuis knows that country—and he knows how to write an action story of sustained interest.

Phillips, Robert L., and Roland F. Rousseau. (Ore. State Coll., Corvallis.) THE USE OF RADIO-TV BY STATE WILDLIFE CONSERVATION DEPARTMENTS. J. Wildl. Mgt. 23(2): 235-237. Apr. 1959.

The study sought to measure how radio-TV were being used by state wildlife-conservation departments in terms of the salaries and size of public-information staffs, education and background of information staff employees, type and extent of program production, and a comparison of their use of radio and television.--Auth. summ.

Ray, Edward M., committee chairman. LEADERSHIP GUIDE IN CONSERVATION EDUCATION. Mich. Dept. Public Instruction & Dept. Cons., Bul. 421. viii + 55 p., illus. 1958.

"...defines opportunities and techniques for leadership development for conservation education. It is especially written to help teachers, school administrators and members of boards of education who are challenged and interested in improving the total conservation program through education." Part I, on opportunities, consists of the following chapters: 1. The challenge of administrative leadership. 2. The teacher and creative leadership. 3. Conservation in curriculum development. 4. Planning for in-service education programs. 5. Community school planning. 6. Project planning. 7. Selecting instructional materials. 8. Leadership opportunities in professional organizations and institutes. 9. National, regional, and county committees. 10. Conservation organizations. Part II, on techniques, has these chapters: 11. The workshop in resource-use education. 12. Community surveys. 13. Resource-use study field trip. 14. Outdoor oriented programs. 15. Resource use personnel.

Vivian, Vincent Eugene. WHAT SCIENCE PRINCIPLES ARE BASIC TO THE CONSERVATION OF SOILS, FORESTS AND GRASSLANDS? AN INVESTIGATION TO DETERMINE THE SCIENCE PRINCIPLES UNDERLYING THE PROBLEMS AND ADVOCATED PRACTICES OF THE CONSERVATION OF SOILS, FORESTS AND GRASSLANDS. Ph.D. thesis, N. Y. U. 309 p. 1958. [From long abstract in Dissertation Abstracts 19(11).]

Intended to help improve teaching at all levels.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

Hipschman, Don. (S. Dak. Dept. Game.) A LOOK AT THE PAST HALF CENTURY. S. Dak. Cons. Digest 26(2): 20-31, 37, 13 photos. June 1959.

This is a good history of conservation in S. Dak. and of the State Dept. Game, Fish & Parks. Despite the title, it begins with Indian days and continues to the present, giving a useful and interesting amount of factual information and biological perspective.

Lowenthal, David. GEORGE PERKINS MARSH: VERSATILE VERMONTER. Columbia U. Press. xii + 442 p., illus. 1958. $6.50. [From review by Paul H. Oehser, Atlantic Nat. 14(2).]

A long-overdue account of the man who, over 100 years ago, saw all our conservation and land-use problems with great clarity and discussed them in his book, THE EARTH AS MODIFIED BY HUMAN ACTION. This great work was first published in 1864, when the U. S. was in a major wave of expansion and exploitation. Prophetic, important, and influential as the book was, it could not turn the trend of times. It must, however, have planted many of the seeds from which the conservation movement grew some half century later. Marsh himself apparently was one of the great men of history, a success in many fields. He was a lawyer, state and federal legislator, editor, farmer, manufacturer, member of Board of Regents of Smithsonian, member of National Academy of Sciences, U. S. minister to Turkey, U. S. minister to Italy for 21 years, a versatile linguist and philologist, expert on Icelandic grammar. He wrote on agriculture, irrigation, history, Catholicism, railroads, education, diplomacy, and a monograph on the camel. He traveled, lectured, and built up a large library--trying most of the time to stay solvent. "So diverse and complex an individual is not easy to synthesize, but Mr. Lowenthal has done it well. He has treated Marsh thoroughly and sympathetically and has produced a book that, we hope will serve to bring this remarkable man and his work to the attention of many modern readers."

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY--Continued

Parker, Sheila, and Rosemary Roberts. SCIENTIFIC TRANSLATIONS / A PRELIMINARY GUIDE TO SOURCES AND SERVICES. US Pub. Health Serv. Publ. no. 514. v + 12 p. 1957. 15¢ from Supt. Documents.

Contains several useful lists: Institutions maintaining files of translations. Published indexes and lists of translations. Periodicals available in complete translation. Periodicals devoted to various articles in translation. Translated tables of contents services. Periodicals devoted to translation as a technique. Professional organizations for translators. Selected references on translations and their sources. Commercial translation agencies.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Krochmal, Arnold, Sherman Paur, and Peter Duisberg. (State U. N. Y., N. Y. C.) USEFUL NATIVE PLANTS IN THE AMERICAN SOUTHWESTERN DESERTS. Econ. Bot. 8(1): 3-20. 1954. [From Biol. Abst. 33(5).]

Taxonomic survey of over 200 useful plants growing in the s.-w. desert areas of N. M. and Ariz. is presented, under usage headings, i.e., medicines, foods, fibers. Information as to economic use summary of Indian traditional uses, and more recent experiment station research results is presented.--A. Krochmal.

Thompson, H. R. (Dept. Sci. and Indust. Res., Wellington, New Zealand.) THE STATISTICAL STUDY OF PLANT DISTRIBUTION PATTERNS USING A GRID OF QUADRATS. Australian J. Bot. 6(4): 322-342. 1958. [From Biol. Abst. 33(6).]

See abst. in Biol. Abst. 33(6).

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Core, Earl L., and Nelle P. Ammons. WOODY PLANTS IN WINTER. Boxwood Press, Pittsburgh 13, Pa. 218 p., illus. 1958. $2.75, paper; $4.00, cloth. [From Nat. Mag. 52(5).]

"This is a manual and guide to identification of the woody plants of the northeastern part of the United States and southeastern Canada in winter. The authors, both professors on the faculty of West Virginia University, have tried out, on students during several winters, the identification criteria that provide their text here. With this book in hand there is no reason to feel that because a tree is resting for the winter you cannot get acquainted with it."

DeSelm, H. R. (Ohio State U., Columbus.) A KEY TO THE NATIVE AND NATURALIZED CLIMBING PLANTS OF OHIO BASED UPON VEGETATIVE CHARACTERS. Ohio J. Sci. 57(5): 284-289. 1957. [From Biol. Abst. 33(8).]

In this vegetative key for the 100 spp. of climbing plants the spp. of Cuscuta are not separated.--Author.

Dutilly, Arthème, Ernest Lepage, and Maximilian Duman. (Catholic U. Am., Washington, D. C.) CONTRIBUTION TO THE FLORA OF THE ISLANDS (T. N. O.) AND OF THE EASTERN SHORES (QUE.) OF JAMES BAY. Contr. Arctic Inst. (Catholic U. Am.) 9F. 1-199, illus., maps. 1958. [From Biol. Abst. 33(6).]

In French. Territory includes the islands of James Bay and a portion of w. Ungava. Data are given on population, location of trading posts, etc. Topography and geology are reviewed, with lists of the characteristic plants of 4 climatic zones. The vegetation of the different types of habitat is discussed. The main part of the work is an annotated list of 719 species in 241 genera.

Giesy, Robert M. (Univ. Coll. North Wales, Bangor.) STUDIES IN OHIO BRYOPHYTES. Ohio J. Sci. 57(5): 290-312. 1957. [From Biol. Abst. 33(8).]

A brief history of bryology in Ohio includes mention of collections since 1900. Under distributional studies, an annotated list, containing 331 spp. in 21 genera and 34 families, is a complete list of all spp. collected from Ohio to date.

Hall, Gustav W. (Ohio U., Athens.) THE VASCULAR FLORA OF THE VINTON FURNACE EXPERIMENTAL FOREST. Ohio J. Sci. 58(6): 357-365. 1958. [From Biol. Abst. 33(8).]

A floristic inventory of this 1200-acre forest, Vinton Co., Ohio, was completed during 1955-56. The tract is hilly, largely wooded, and supports a rich native flora. The Central States For. Exp. Sta. is utilizing the area for long-range experiments in forest management. Specimens of 536 species of vascular plants representing 314 genera of 95 families were collected and deposited at Ohio U. Background information on history and vegetation patterns of area and current frequency of each species is given.--From auth. abst.

Hill, Clara Chapman. SPRING FLOWERS OF THE LOWER COLUMBIA VALLEY. U. Wash. Press, Seattle. 164 p., illus. 1958. $3.00. [From Biol. Abst. 33(8).]

This guide to spring-blooming herbs and shrubs of woods, fields, and roadsides, contains keys, brief descriptions, and 71 full-page line drawings of common spp. found in area. Notes are given on habitats, range, time of blooming, origin of names, special characteristics, and uses of the plants by Indians, civilized man, domestic animals, and wildlife. A glossary, key to abbreviations of plant describers, bibliography, and index are provided.--R. W. Dexter.

Lathrop, Earl W. (La Sierra Coll., Arlington, Calif.) THE FLORA AND ECOLOGY OF THE CHATAUQUA HILLS IN KANSAS. U. Kans. Sci. Bul. 39(1): 97-209, illus., maps. 1958. [From Biol. Abst. 33(5).]

The Chatauqua Hills area, a physiographic province in Kansas lying between the Osage Plains on the east and the Flint Hills on the west, marks the northern limit of the Texas Biotic Province. Topography, soil, climate, etc., are discussed, together with an account of the original vegetation of the area. The area is characterized by low rolling hills capped with sandstone and covered on the tops and upper slopes with Quercus spp. forming an oak savanna. These oaks, relicts from a former moist phase of the climatic cycle, have been able to maintain themselves against the competition of grasses by virtue of the favorable amount of water available in the sandy soil. Trees common in flood plains become admixed with these oaks on slopes and in gullies and ravines. Evidence from early survey notes indicates that these hills were wooded before the time of settlement, but the upland forests were not so extensive or dense as they are at present. Prolonged protection from fire permitted encroachment of upland trees into the surrounding prairie area. The amount of prairie has been decreased also by plowing; in many prairie areas which remain, their original spp. were replaced by less desirable grasses and weeds. Tree spp. in the flood plains and uplands at present are essentially the same as before settlement. An annotated list of 1030 taxa of vascular plants includes species percentage composition for the characteristic plants of the woodland and prairie.

Lewis, Mont E. CAREX--ITS DISTRIBUTION AND IMPORTANCE IN UTAH. Brigham Young U. Sci. Bul., Biol. Ser., 1(2): 1-43 + 5 pl. + folding chart. Jan. 1958.

Utah has more than 90 species of Carex, chiefly in mountain areas. Lewis provides keys and descriptions for all species, outlines general and Utah distribution, tells what the habitat of each species is, and gives brief discussion of forage value of some species. According to the introduction, the species of Carex have a range of palatability about equal to that of grasses; the genus as a whole is as important in forage production as the better grass genera, except for the 3 best genera of grasses.

Li, Hui-Lin. AN ILLUSTRATED KEY TO THE GENERA OF CONIFERS. Morris Arbor. Bul. 7(4): 47-52, illus. 1956. [From Biol. Abst. 33(5). No abstract.]

Moir, David Ross. A FLORISTIC SURVEY OF THE SEVERN RIVER DRAINAGE BASIN OF NORTHWESTERN ONTARIO. Ph.D. thesis, U. Minn. 267 p. 1958. [From abstract in Dissertation Abstracts 19(10).]

Annotated list of 600 species of vascular plants. Also descriptions of representative plant communities, including spruce-fir forest, stunted spruce muskeg and lichen woodland, and tundra-like cover. Physiography, geological history, soils, and climate are described.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY--Continued

Osburn Wm. Sherman, Jr. ECOLOGY OF WINTER SNOW-FREE AREAS OF THE ALPINE TUNDRA OF NIWOT RIDGE, BOULDER COUNTY, COLORADO. Ph.D. thesis, U. Colo. 96 p. 1958. [From abstract in Dissertation Abstracts 19(10).]
Effects of wind, humus, rainfall, and gophers on plant succession were studied in four selected stands. Eventual dominant is expected to be Kobresia bellardi, a fibrous-rooted plant. A topographic climax of cushion plants may persist in the most exposed and windy sites where humus is not readily built back to the point where it is capable of holding enough water at the surface to support Kobresia.

Robinson, Franklin D., and Royal E. Shanks. (U. Tenn., Knoxville.) CHECK-LIST OF VASCULAR AQUATIC PLANTS OF TENNESSEE. J. Tenn. Acad. Sci. 34(1): 58-65. Jan. 1959.
Counties of occurrence are listed for most species.

Russell, Norman H. (Grinnell Coll., Grinnell, Iowa.) A CHECKLIST OF THE VASCULAR FLORA OF POWESHIEK COUNTY, IOWA. Proc. Iowa Acad. Sci. 63: 161-176. 1956. [From Biol. Abst. 33(6).]
Plant families and genera and species are arranged alphabetically.

Scagel, Robert F. AN ANNOTATED LIST OF THE MARINE ALGAE OF BRITISH COLUMBIA AND NORTHERN WASHINGTON (INCLUDING KEYS TO GENERA). Natl. Mus. Canada Bul. 150. 1-289, map. 1957. [From Biol. Abst. 33(8).]
A preliminary key to the genera of marine algae in the area, based on the present check list, and a historical review are included. 478 spp. are recorded. For each species, references, distribution, and new records are given, with brief notes on habitat.

Sjörs, Hugo. (Roy. Sch. For., Stockholm 51, Sweden.) BOGS AND FENS IN THE HUDSON BAY LOWLANDS. Arctic 12(1): 2-19, 13 figs. Mar. 1959.
Interesting, well-illustrated study of the physiography, causation, vegetation, and factors affecting these vast peatlands.

Strausbaugh, P. D., and Earl L. Core. FLORA OF WEST VIRGINIA (PART III). W. Va. U. Bul., Ser. 58, no. 12-3: 571-860, illus. June 1958. $2.00 from W. Va. U. Bookstore, Morgantown.
This volume covers plants from flax through plantain. As in parts I and II, keys and brief descriptions with adjacent drawings constitute a complete and useful handbook.--Neil Hotchkiss.

Thorne, Robert F. (U. Iowa, Iowa City.) THE FLORA OF JOHNSON COUNTY, IOWA. Proc. Iowa Acad. Sci. 62: 155-196. 1955. [From Biol. Abst. 33(6). No abstract.]

Ward, Richard T. (Beloit Coll., Wis.) VEGETATIONAL CHANGE IN A SOUTHERN WISCONSIN TOWNSHIP. Proc. Iowa Acad. Sci. 63: 321-326, map. 1956. [From Biol. Abst. 33(6). No abstract.]

Wolden, B. O. THE FLORA OF EMMET COUNTY, IOWA. Proc. Iowa Acad. Sci. 63: 118-156. 1956. [From Biol. Abst. 33(6).]
The present list of plants includes brief collection notes. Some ecologic changes, both natural and man-effected, of recent years are noted.

PLANTS--FOREST SURVEYS

Ferguson, Roland H. THE TIMBER RESOURCES OF DELAWARE. US For. Serv., NE. For. Exp. Sta., Upper Darby, Pa. ii + 30 p., 9 figs. 1959.
Discusses forest industries, forest area, growing stock, timber volumes, growth and cut, future prospects. Presents tabular data on these subjects. Sussex Co. is 42% forested, chiefly with pine, but the other 2 counties are only 21% forested. Timber volume is greater than cut and is still growing. Economically, however, this volume should be more in softwoods and more in larger trees. More planting, protection, and forest management is needed. But almost all the forest land is in private hands and 90% of it is in holdings too small to justify employment of a professional forester.

WILDLIFE--NEW GAME SERIES

WILD LIFE. Published quarterly by Kenya Wild Life Society, Box 8983, Nairobi, Kenya. Vol. 1, no. 1, 56 p., illus., Mar. 1959. Price per year 13/50 s., post-free in E. Africa. Price this issue, 3 s.

This new journal of wildlife conservation in E. Africa is an interesting, well-illustrated, and informative replacement for the Society's annual report. A mixture of the popular and the semitechnical, and with articles on both conservation and natural history, Wild Life should appeal to readers of varied types. Articles of the present issue deal with: the vast flamingo flocks of Lake Nakuru and other lakes of E. Af.; the rapid destruction of black rhino populations that is now under way; the surprising wildlife wealth of Nairobi Natl. Park; success in stopping wholesale exploitation of African birds, especially lovebirds; launching of the American African Wild Life Fund; status and conservation needs of the red lechwe (antelope) in N. Rhodesia; the menace of exterminative poaching; observations on hunting methods of Af. wild dogs; Fraser Darling's comments on the critical position of E. Af. wildlife; and water developments for stock and wildlife in the Amboseli area.

Wild Life has been started as a most sane and commendable effort to bring attention to the need of reversing the rapid decline of E. Africa's game stocks, and to convince everyone that the game is an economic resource well worth saving, second in value only to agriculture. The immediate need is effective preservation. Regulated use by natives must come, and it must be accompanied by native appreciation of game's continuing value if wisely used rather than destroyed.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Bodenheimer, F. S. ANIMAL ECOLOGY TO-DAY. Monog. Biol. vol. 6. Dr. W. Junk, Den Haag, Neth. 267 p., 41 figs., 31 tables. 1958. $7.50.
[From reviews by R. H. MacArthur, Ecology 40(2), and A. Milne, Nature, May 2, 1959.]

Both reviews indicate that this book has excellent material and some very weak material; it is not suited to uncritical readers. MacArthur points out various important shortcomings. He also says: "By presenting data in tabular form he has succeeded in putting a surprising number of facts into the book. Thus a particularly thorough survey of life tables and age distributions of different populations is given, omitting however a discussion of the intrinsic rate of natural increase, r. This is followed by a fine section on the relation between local climate and the incidence of various species. The discussion of population regulation in general is excellent, if the reader is willing to do his own summarizing and ignore the semantic problems..." According to Milne's review, the book's central theme is population fluctuations and their causes. From this point of view, Bodenheimer discusses longevity, life history, population dynamics, the community, environment and heredity in animals, and closes with a thoughtful consideration of human ecology and population problems. The book is not written against anyone or any theory, but it is slanted by the author's own views, and it is not uncritical of views Bodenheimer opposes. "This is not a book for beginners. It should be regarded as a thought-provoking supplement to text-books such as those of Allee et al. and Andrewartha and Birch. The mature ecologist will find much with which to agree and much with which to disagree. Where acceptable it is sometimes illuminating, and where unacceptable it is occasionally stimulating. Theorists, and those who do not readily distinguish between theory and fact, should profit by reading pp. 190-201."

Rudd, Clayton G., editor. YELLOWSTONE - GEYSER WONDERLAND. Naturalist 10 (2): 1-64, illus. June 1959. $2.00, paper, from Nat. Hist. Soc., 315 Medical Arts Bldg., Minneapolis 2, Minn.

Another handsome Special Issue, lavishly illustrated in color. The several wildlife articles it includes are by men who know the animals from direct experience in the park; the articles therefore report some original information although most of them are popular. Grey Ghosts (p. 4-6), by David de L. Condon, Chief Naturalist at Yellowstone, is on grizzlies. These bears are smaller than sometimes thought, as several weights reported here indicate. A large ♀ may weigh about 400 lbs.; large ♂♂, 500-600 lbs. Grizzlies are omnivorous, but they regularly hunt elk calves and kill adult elk, moose, and sometimes bison. Most park grizzlies concentrate around refuse dumps in summer and can be counted; there are perhaps 140-200 in the park. Expansion of grizzly range in

U. S. is much to be desired, but requires more knowledge of grizzly biology and more public support. Black Bear (p. 20-23), by Robert J. Jonas, Naturalist at Yellowstone, emphasizes reasons for which black bears become dangerous to tourists and tabulates personal injuries, property damage, and bears killed for control in the last 5 years. About 1 person per day is scratched or bitten by a bear in the park during the season. Trumpeter Swan (p. 27-29), by George D. Marler, Naturalist at Yellowstone, tells of history and biology of these swans, emphasizing the protective importance of the park and illustrating the extreme dangers of adjacent areas. Coyote (p. 44-45), by Adolph Murie of Moose, Wyo., shows why coyote predation is needed in the park and why coyotes are scientifically and esthetically desirable there. Large Mammals (p. 52-54), by Merrill D. Beal, Naturalist at Yellowstone, gives a little information about each species of ungulate. Beaver (p. 60-61), by R. J. Jonas, tells how important beaver once were in the park and why they have become scarce under complete protection.

WILDLIFE--NATURAL AREAS & REFUGES

Anon. 1958 PUBLIC USE OF NATIONAL WILDLIFE REFUGES. US F&WS, Wildl. Leafl. 406: 1-4. Apr. 1959.

Tabulation for each refuge of visitor-days used for hunting, fishing, and miscellaneous purposes. The total of 9,114,000 represented an increase of 5% over 1957. Wildlife observations, picnicking, and swimming were the most popular of miscellaneous uses, which accounted for 60% of visitor-days, but fishing alone accounted for 36.5% of visitor-days.

Anon. PUBLICATIONS ON THE NATIONAL WILDLIFE REFUGES - 1959. US F&WS, Wildl. Leafl. 407: 1-4. Apr. 1959.

Lists, for individual refuges, the pertinent publications in 3 series issued by the F&WS: Refuge Leaflets, Refuge Bird Lists, and Conservation in Action. Also listed are the single members of the Refuge Mammal List and Refuge Historical Leaflet series.

Belsky, P. (Reserves & Game Dept., Ministry Agr., USSR.) CONSERVATION IN THE U.S.S.R. Nat. Mag. 52(5): 258-260, 6 photos. May 1959.

Concise account of what has been accomplished and what is projected by way of setting up nature reserves, restoring game animals, and making studies on the reserves. Also sketches the organization of conservation research and operations in the USSR. The plan is to have a reservation in each natural area of the Union. This should mean that within 20 years there will be 116 reserves with total area of 39,536,000 acres. At present there are 56 with total area of nearly 6,600,000 acres. Management for the benefit of animals is practiced: special foods are planted, winter feeding is done, water is provided in dry areas, willows and poplars are planted for beaver, rafts are built to shelter animals in big spring floods, nest boxes are put up for birds. In 1958 an All-Union conference on reservations was attended by 400 people representing 159 scientific, public, and state organizations. Reserves and other conservation activities are conducted at all levels of government and by various federal departments.

Branch of Wildlife Refuges. 1959 - ADDRESS LIST OF REFUGE MANAGERS. US F&WS, Wildl. Leafl. 408. 8 p. May 1959.

Refuges are listed by region and state. For each refuge, manager is named and his address is given.

Breiding, George H. (Director of Nat. Ed., Oglebay Inst., Wheeling, W. Va.) A WILDLIFE SANCTUARY FOR YOUR COMMUNITY. Aud. Mag. 61(2): 81, 86. Mar.-Apr. 1959.

"Helpful suggestions for garden clubs, women's clubs, conservation, youth, and civic clubs, and other organizations that would like to establish a sanctuary."

Decker, Eugene. (Westmoreland Sanctuary, Mt. Kisco, N. Y.) THE USE OF HERBICIDES IN NATURE SANCTUARY MANAGEMENT. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 372-376. Jan. 1959.

Nicholson, E. M. BRITAIN'S NATURE RESERVES. Country Life, London. 174 p., illus. 1957. $6.75. [From review by S. F. R., Mass. Aud. 43(4).]

"Mr. Nicholson is the Director General of the Nature Conservancy. In this book he has written a short description of forty-five of the eighty-seven British Nature Reserves. These Reserves are located from the south of England to the Shetland Islands, including Wales. Information is given about the size of each Reserve, its exact location, and its access. Some are open to the public, some require permits, others are completely restricted. There are sixty-five excellent photographs which give a good idea of the wide variety of areas which are held under the Nature Conservancy. The bibliography and the addresses of the various local Trusts and Conservancies should be a great help to anyone interested in natural history and who is planning a trip to Great Britain."

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Simon, Noel. (Kenya Wildl. Soc., P. O. Box 20110, Nairobi, E. Af.) WILDLIFE CHALLENGES IN EAST AFRICA. Animal Kingdom 62(2): 50-55, 2 photos. Mar.-Apr. 1959.

Today only a few localities in Africa have significant stocks of large mammals. The best, Serengeti Natl. Park, has about 400,000 head. No other area has 1/4 as many. Poaching takes about 150,000 animals a year in and near Serengeti. The elephant population of Tsavo Park is about 4,000, and about 1,000 per year are killed by poachers in the region. No more than 1,000 black rhinos remain in Kenya, yet 10 years ago 900 were shot officially in just one area. There are only 2 hopes: 1) useful fact finding, 2) persuasion of Africans. Education should be pressed, but more and quicker action is essential. Africans must be given benefit from maintaining game stocks; this means that the idea of legitimate harvest and wildlife management must be accepted in Africa as it is in Am. Many areas are better suited to producing protein via wildlife than for anything else. Areas for this purpose should be set up. Where possible, zones of this type should surround parks. A plan to benefit one tribe through regulated harvest of game has been proposed. Such plans are more practical for some land types than are attempts to rear exotic livestock, which are not adapted. As to research, expert and financial aid from abroad is essential. Funds for all Kenya government services are less than those of the U. S. Natl. Park Service. A permanent research staff should be set up on a funds-matching basis. Immediate action is required. It is already too late for many parts of Africa and in 10 years it may be too late for East Africa. The next 5 years are critical.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Brown, Frank A., Jr. (NW. U., Evanston, Ill.) THE RHYTHMIC NATURE OF ANIMALS AND PLANTS. Am. Sci. 47(2): 147-168, 9 figs. June 1959.

After giving much information on rhythms in nature and experimental studies of them, Brown concludes that we should be skeptical about the existence of biological clocks within organisms. Experiments suggest that it is far more likely that even organisms kept under so-called constant conditions are continuously receiving information about the natural geophysical cycles from the external environment. The implications of this idea "are tremendous with respect to the potentialities involved through the demonstration that living things are sensitively responding to additional kinds of stimuli at energy levels so low that we have hitherto considered the living organism completely oblivious of them. These latter potentialities may soon loom importantly in many areas of biology and medicine, especially in such problems as animal navigation and behavior."

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Borg, Karl. (Veterinärmed. Anstalt, Stockholm 50, Sweden.) EFFECTS OF DRESSED SEED ON GAME BIRDS. VIII Nordiska veterinärmötet--Sektion B, rapport 17, p. 1-6 in reprint. 1958.

In Swedish with English summary. Birds of various species were fed mercury-dressed seed daily. Deaths did not occur until about 1 month after tests began. Mercury content of organs at death was 90-100 mg/kg. In non-fatal cases, mercury could be detected in organs for 6-7 months. Feeding pheasants mercury-dressed seed for 9 days did not affect egg production, but did depress hatchability. As much as 12 mg/kg of mercury was found in organs of pheasants shot during hunting. Seed dressed with aldrin and mercury killed pheasants in 8-18 days when fed for 7-11 days; organs contained 3-4 mg/kg mercury. "The LD_{50}-value of aldrin has been estimated for a few bird species. During the last few years a considerable number of deaths have been observed in certain parts of Sweden among seed-eating bird species, e.g., wood-pigeon, corvine birds, and finches. Among domestic pigeons the mortality has also been high. The increased mortality can be attributed to the consumption of aldrin-mercury-dressed seed."

Briejèr, C. J. (Plant Protection Service, Wageningen, Holland.) NEED FOR RE-ORIENTATION IN THE FIELD OF INSECT CONTROL. Atlantic Nat. 14(2): 97-104. Apr.-June 1959.

Dr. Briejèr, head of the Plant Protection Service in Holland, considers the use of stronger and stronger poisons to be utter folly. He explains at length that scientists have become overly specialized and generally ignorant men, strong in a few techniques, short in wisdom. It is essential to open the compartments and get some real cooperation with the aim of arriving at more sound, biological solutions to insect-damage problems.

"I should like to make it a principle that natural controls of insects be given preference to artificial controls. By natural controls, I mean cultural methods, the growing of resistant varieties, the stimulation of natural balance, and the like... When no natural solution can be found, the most prudent way to apply chemicals must be sought. Methods which affect only the organism in question and which have as little additional effect as possible should be the goal. Besides chemicals which can kill the organism, we must also search for repellents. Only in extreme cases should we reach for the all-killing highly toxic poisons, the group to which many of the modern products belong. These should be considered just an emergency solution, which we should strive to abandon as soon as further research makes it possible... It is humiliating for our science that we can offer our farmers and gardeners little more than poisonous palliatives and even claim that they are such a superb solution." Instead of seeking and using the deadly chemicals that the author considers only dangerous palliatives, we should seek selective chemicals. "Fortunately, a number of such selective chemicals have been found already, especially for fighting mites. They offer the undeniable advantage of not killing the enemies of the harmful organisms, so that these can eventually take care of the individuals resistant to the pesticides. So here and there serious attempts are being made to find better methods for the protection of our crops than the extremely poisonous, all-killing pesticides."

Channing, C. H. (Box 331, Clear Lake, Wash.) HIGHWAY CASUALTIES OF BIRDS AND ANIMALS FOR ONE YEAR PERIOD. Murrelet 39(3): 41. Sept.-Dec. 1958.

List of birds and mammals found killed on about 22 mi. of highway, chiefly between Clear Lake and Mt. Vernon, Wash. Total was 137. Rabbits and skunks were mammals hit most often; robins and song sparrows topped the bird list, owing to their use of roadside cover and perches.

Clawson, Sterling G., and Maurice F. Baker. (Ala. Poly. Inst., Auburn.) IMMEDIATE EFFECTS OF DIELDRIN AND HEPTACHLOR ON BOBWHITES. J. Wildl. Mgt. 23(2): 215-219, 1 map. Apr. 1959.

3600 acres were treated with heptachlor and dieldrin near Camden, Ala. for fire-ant control. Pre- and posttreatment censuses of bobwhites revealed a complete loss of resident quail on a treated area and 3% loss on a check area. Available evidence, including chemical analyses of carcasses, indicated the poisons used were the cause of disappearance of quail on the treated area.--Authors.

Figueroa Potes, Adalberto. DISRUPTION OF NATURAL EQUILIBRIUM THROUGH THE USE OF MODERN INSECTICIDES. Revista de la Academia Colombiana, nos. 33-34, p. 92-105. 1953. Fisheries Research Board of Canada, Translation no. 14, 2 p. summary translation by G. Marsh, is available on request from Pacific Biological Station, Nanaimo, B. C.

Furniss, Robert L. (US For. Serv., Pac. NW. For. & Range Exp. Sta., Portland, Ore.) ANSWERS TO SOME CRITICISMS OF AERIAL SPRAYING IN FOREST MANAGEMENT. J. For. 57(4): 260-262. Apr. 1959.

We know a great deal about the effects of DDT on man and animals, enough to use it safely. We cannot refrain from using it until all possible research is done--the economic need is too great. Treatments are effective in protecting forests, sometimes give better than 95% kill of pests. Talk about upsetting the balance of nature doesn't take account of realities. When things were left up to nature, huge insect outbreaks destroyed millions of dollars worth of timber. Now spraying is used as an emergency measure to help natural controls regain dominance, and it may or may not do so. It is true that beneficial insects are reduced, but they usually recover as rapidly as do the pest forms. Insecticide resistance in forest pests is not to be expected, for most forest tracts are sprayed only at intervals of some years. Resistance has not appeared. It is true that fish and wildlife may be hurt by sprays, but such harm has appeared in serious degree only in a few places of the many treated, and it must be remembered that destruction of forests by insects, which is often followed by fire, is also hard on streams and animal life. We should, of course, take precautions against kills of fish and wildlife. To safeguard the right to spray, we must: 1) be sure a given treatment is necessary, 2) work carefully to avoid damage to fish and wildlife, 3) develop better and more harmless control methods, 4) publicize the need of control programs and fight to keep the program going while supporting research on better methods.

George, John L. (Patuxent Refuge, Laurel, Md.) EFFECTS ON FISH AND WILDLIFE OF CHEMICAL TREATMENTS OF LARGE AREAS. J. For. 57(4): 250-254. Apr. 1959.

"The history of field investigations of the effects of DDT on wildlife is reviewed briefly, from the initial studies in 1945 through the more recent studies of the effects of the large-scale programs for spruce-budworm control and gypsy-moth eradication. DDT dosages and procedures that are recommended for protection of wildlife are reviewed. Effects of aldrin, heptachlor, and toxaphene are discussed in connection with the grasshopper and Mormon cricket control programs. Delayed and indirect effects of chemical treatments are emphasized as an important current problem. Cited in this connection are fish losses in the Yellowstone and Miramichi rivers and losses of wildlife from eating earthworms a year after treatment of the area with DDT. Currently recommended procedures to safeguard wildlife in pesticidal programs are listed." --Auth. summ.

Karlog, Ole, and Knud O. Møller. (U. Copenhagen, Sweden.) THREE CASES OF ACUTE LEAD POISONING. ANALYSES OF ORGANS FOR LEAD, AND OBSERVATIONS ON POLAROGRAPHIC LEAD DETERMINATIONS. Acta Pharmacol. et Toxicol. 15(1): 8-16. 1958. [From Biol. Abst. 33(8).]

"A method for polarographic lead determinations is described; 5-10 μg lead can be determined. In 3 cases of acute lethal lead poisoning, the following content of Pb was found in the organs: liver 16-95 μg/g, kidney 4-16 μg/g, muscle 2-7 μg/g, spleen 3-8 μg/g, brain 1-3 μg/g, bone (one determination) 2 μg/g. In the liver of the fetus of one of the patients there were 21 μg/g, 30% more than in the liver of the mother."--Erik Jacobsen.

Keenleyside, M. H. A. (Biol. Sta., St. Andrews, N. B.) THE EFFECTS OF SPRUCE BUDWORM CONTROL ON SALMON AND OTHER FISHES IN NEW BRUNSWICK. Trans. NE. Wildl. Conf., 1: 73. 1958 (1959). [Abstract only.]

Martin, J. P., and others. WHAT PESTICIDES DO TO SOILS. 1. FUMIGANTS, FUNGICIDES, AND THE SOIL. 2. INSECTICIDES AND THE SOIL. 3. HERBICIDES AND THE SOIL. J. Agr. & Food Chem. 6(5): 344-353. May 1958.

Motl, Laurence F. (Wis. Cons. Dept.) TOXIC INSECTICIDE CONTROL IN WISCONSIN. Wis. Cons. Bul. 24(3): 3-5. Mar. 1959.
Wis. has laws and regulations about use of insecticides on forest and non-crop (including city) lands. The regulations were revised recently to make them more practical and enforceable, particularly in connection with spraying for control of Dutch elm disease. Certain types of spraying can be done without permit, but for all other types permission must be obtained from the Cons. Dept. Details, merits, and shortcomings of the system are reported here.

Shepard, Paul, Jr. (Knox Coll., Galesburg, Ill.) BIOLOGICAL PERSPECTIVE ON THE BROAD SCALE USE OF CHEMICAL PESTICIDES. Mass. Aud. 43(4): 165-167. Mar.-Apr. 1959.

Webb, F. E. (Sci. Serv., Can. Dept. Agr., Fredericton, N. B.) AERIAL CHEMICAL CONTROL OF FOREST INSECTS WITH REFERENCE TO THE CANADIAN SITUATION. Can. Fish Culturist no. 24: 1-14, 4 maps. Feb. 1959.
An unusually good discussion of why and how forest spraying is done in Canada, especially for spruce budworm in N. B., and how much good it has done for the forest. Maps show the large portions of the province that were sprayed 1-4 times in the period 1952-57, and show how these areas blanket certain drainages of salmon streams. Webb concludes that forest spraying on a large scale is necessary and must continue, although it should be done so as to harm other interests as little as possible. Efforts to find better and more harmless methods should continue.

WILDLIFE--PARASITES & DISEASES

Ignoffo, Carlo M. (Iowa Wesleyan Coll., Mt. Pleasant.) EVALUATION OF TECHNIQUES FOR RECOVERING ECTOPARASITES. Proc. Iowa Acad. Sci. 65: 540-545. 1958. [From Biol. Abst. 33(5).]
Analyses were made of the flotation and dissolution techniques as methods of recovering ectoparasites. Comparisons were made on the basis of effective recovery, selective recovery, and inherent variation. The dissolution technique recovered at least 90% of the total population; was not selective to any ecto-parasite group; showed less than 10% coefficient of variability. In contrast, the flotation technique recovered 25% of the total population; appeared more selective to mite recovery; gave a 25% coefficient of variability. The dis-solution technique offers the one most accurate and reliable numerical appraisal of the total ectoparasite population.--From auth. abst.

Yamaguti, Satyu. SYSTEMA HELMINTHUM. VOL. I. THE DIGENETIC TREMATODES OF VERTEBRATES. Pt. 1: xi + 1-980. Pt. 2: iii + 981-1575. Illus. Interscience Publishers, 250 5th Ave., N. Y. 1, N. Y. 1958. $90.00. [From long review by Ben Dawes, Nature, Apr. 4, 1959.]
First volume of a monumental work on which author has spent 30 years. Volumes of this series are expected to serve as major tools in parasitology. The present volume is a systematic treatment of the digenetic trematodes of vertebrates. It includes keys and diagnoses for 102 families and 1,024 genera. Species are simply listed. There are 1,302 illustrations. The number of references cited is 4,037. The work is based on characters of adults rather than on developmental features.

WILDLIFE--POPULATIONS & FLUCTUATIONS

Varley, G. C., and A. J. Nicholson. (U. Mus., Oxford, Eng., and C.S.I.R.O., Canberra, Australia.) DENSITY-DEPENDENT FACTORS IN ECOLOGY. Nature 183(4665): 911-912. Mar. 28, 1959.
Rebuttals of Andrewartha's attack (Nature 183: 200) on Nicholson's views and especially on one of Nicholson's formulas.

WILDLIFE--BIOMETRICS

Chapman, Douglas G. PROBLEMS OF ESTIMATION OF WILDLIFE MORTALITY RATES. Biometrics 13(4): 548-549. 1958. [From Sport Fish. Abst. 3(2).]
The estimation of mortality rates of wild animals in general has been based on one of two methods--recoveries of tagged or marked members of the population and sampling of the population to determine its age structure at one or more time periods. The sources of bias in these methods are discussed. Several different formalae are reviewed and a new formula given which may be useful for those fish and animals where the largest cause of mortality is predation by man. The effect of the various sources of bias on the formulae is noted. Consideration is also given to the determination of estimates of the variances of the estimates; it will be usually preferable to find internal rather than externa estimates of such variances.

Hannan, E. J. (Australian Natl. U., Canberra.) AN EXACT TEST FOR CORRELATION BETWEEN TIME SERIES. Biometrika 42(3/4): 316-326. Dec. 1955.
Uses as an example the data presented by Moran (J. Animal Ecol. 21(1): 154-158) on the number of certain game birds shot over a period of years.--V. Schultz.

Kruskal, W. H. (U. Chicago.) ORDINAL MEASURES OF ASSOCIATION. J. Am. Stat. Assn. 53(284): 814-861. Dec. 1958.
Rank measures of association for bivariate populations are considered.--V. Schultz.

Ramakrishnan, Alladi, and S. K. Srinivasan. (U. Madras, India.) ON AGE DISTRIBUTION IN POPULATION GROWTH. Bul. Math. Biophys. 20(4): 289-303. 1958. [From Biol. Abst. 33(5).]
The statistical problem of age distribution in population growth involves the well known difficulties in mathematical probability of defining the distribution of a discrete number of random points (individuals) in a continuous parametric space (age). The assumption of the possibility of multiple births makes the problem more complicated, and we are constrained to introduce the concept of multiple points. This leads to an extension of the method of product densities devised earlier for the treatment of population problems. The paper deals with such an extension and as an example of the application of this method the population problem with twins is discussed.--Auth. abst.

WILDLIFE--TECHNIQUES

Alexander, Maurice M. (Syracuse U., Syracuse, N. Y.) THE HABITAT MAP: A BASIS FOR WILDLIFE MANAGEMENT. N. Y. Fish & Game J. 6(1): 103-113, 4 figs. Jan. 1959.
"The importance of a cover or habitat map in wildlife management is well known. However, there are but a few available mapping techniques that are specially designed for use by wildlife managers. There is a definite need for further work on this basic subject. A system of habitat classification and mapping was developed on an area in central New York. This system is based on a successive breakdown of habitat types in different degrees of detail. This permits the easy comparison of any two areas even though they may not have been mapped in the same detail. The technique as described is simple in its application, requires only a moderate amount of time and expense, and is sufficiently flexible to be used under various conditions."--Auth. abst.

Bruns, V. F., and C. E. Anderson. (Irrigation Exp. Sta., Prosser, Wash.) METAL PLOT STAKES FOR ROCKY SOILS. Weeds 7(2): 230-231, 1 photo. Apr. 1959.

Byer, M. D., J. E. Cantlon, and C. M. Wetmore. (Mich. State U., E. Lansing.) A PUNCH CARD TECHNIQUE FOR STUDYING SPECIES AND SPECIES-ENVIRONMENT ASSOCIATIONS. Ecology 40(2): 323-324, 2 figs. Apr. 1959.

Downing, Robert L., and Charles M. Marshall. (Ga. Game Comm., Atlanta.) A NEW PLASTIC TAPE MARKER FOR BIRDS AND MAMMALS. J. Wildl. Mgt. 23(2): 223-224, 1 photo. Apr. 1959.

A color marker employing plasticized polyvinyl chloride extruded tape was tested on several kinds of birds and on gray squirrels. It was as secure as the jesse knot marker and easier to attach. Specifications and sources of supply are listed.--Authors.

Kelker, George Hills. (Utah State U., Logan.) RESEARCH METHODS FOR THE BEGINNER / A MANUAL FOR THE OUTDOOR BIOLOGIST ON PROCEDURES IN PLANNING, PERFORMING, ANALYZING, AND WRITING THE RESULTS OF AN INVESTIGATION. Revised edition. Utah State U., Logan. vii + 144 p. Nov. 1958.

A revision of the 1st edition, 1956 (see WR 88 p. 9). It is a pioneering effort in presenting the fundamentals of research and publication procedures in a teaching manual for junior classmen. The manual is intended as a teaching aid that is to be supplemented by student and teacher participation. It is not a source manual for advanced research workers. "Several important changes have been made in the second revision. The first two lessons and the last one have been combined; all lessons have been checked for better expression; illustrations on note taking have been included because some biologists think narration of field notes is a thing of the past; and good and poor illustrations on abstract writing are included. The chapter on frequency has been omitted, with two units put in the chapter on graphs. A second notable change over the first edition is the inclusion of a glossary of about 200 words, including a selection from the recent Wildlife Management Glossary, as well as including some legal terms used in Wildlife Enforcement work."--V. Schultz.

Layne, James N. (U. Fla., Gainesville.) A SIMPLE AND INEXPENSIVE SMALL ANIMAL CAGE FOR LABORATORY USE. Turtox News 36(8): 208-209. Aug. 1958.

Marvin, Kenneth T. A DEVICE FOR RAPID CONVERSION OF TITRATION VALUES TO SALINITY. Limnology and Oceanography 2(4): 371-374. 1957. [From Sport Fish. Abst. 3(2).]

Conversion of titration units to salinity units using the Knudson table is slow and tedious when many data are being processed. A study of the salinity equation resulted in various graphical solutions. A graph, which is presented, is probably the simplest of those derived, requiring only slight modification to convert it into a device that can be used to convert titration units into salinity units with a precision and speed far exceeding that obtained by using the Knudsen conversion tables.--Auth. abst.

Pimlott, Douglas H., and H. W. Mossman. (Dept. Lands & For., Rt. 2, Maple, Ont.) A MACROSCOPIC OVARY-SECTIONING METHOD. J. Wildl. Mgt. 23(2): 232-233. Apr. 1959.

Rows of moose ovaries were embedded in a pan between layers of a cooked mixture of corn meal and gelatine. When solid, block was removed from pan and soaked in 10% formalin for 48 hours. It was then sliced on a commercial meat slicer. Slices were even and uniform. Desired pieces could be taken out and prepared for histological study. Authors give details of method and tell how they number and keep track of individual ovaries and slices of them. The technique is adapted from one used for making slices of brains and is believed to have wide applicability.

Romanov, A. N. (Komi Branch, USSR Acad. Sci.) AUTOMATIC TAGGING OF WILD ANIMALS AND PROSPECTS FOR ITS USE. Translation by J. M. MacLennan, Can. Wildl. Serv., 6 p., processed, from Zool. Zh. 35(12), 1956, starting p. 1902. Single copies of transl. available on request to Can. Wildl. Serv., Ottawa, while supply lasts.

A very important paper, if the technique proves to be as valuable and generally applicable as it seems to the author and to the present reviewer. The basic idea is simple--the snare. But where most snares tighten and choke, the kind described and illustrated here tightens only to a given point, where it locks. The main snare cord then breaks, leaving around the animal's neck a sturdy, flexible collar bearing a number. One person can rig up hundreds of sets, and he need not revisit them any oftener than he wishes. Type of set and

type of collar can be adjusted for all animals from game birds and hares up to large predators and big game. In skilled hands the snare is a universal method of taking wild animals. "Large carnivores (bear, wolf, wolverine, etc.) and ungulates (moose, deer) also may be automatically tagged, as there are very effective methods of snaring those animals. In tagging large animals one may use, instead of ordinary tags, hermetically-sealed medallions enclosing paper 'passports'. In addition one may attach to the collar a portable apparatus emitting sounds or radio signals." With a snare that has a stop to prevent choking and a cord that does not break, animals can be taken alive.

Whelen, Townsend, and Bradford Angier. ON YOUR OWN IN THE WILDERNESS. Stackpole Co., Telegraph Press Bldg., Harrisburg, Pa. xi + 324 p., illus. 1958. [From review in Outdoor News Bul. 13(12).]

The authors "have combined their vast experiences camping and bivouacking to produce the perfect guide to peace of mind and freedom in the back-woods country. They explain what from their experience they found to be the best ways of entering wild and unspoiled country, of finding their way through it, and living there in comfort and safety."

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Cheatum, E. L. (N. Y. State Cons. Dept., Albany.) NEW YORK'S FISH AND WILDLIFE MANAGEMENT ACT. Trans. NE. Wildl. Conf., 1: 196-200. 1958 (1959).

See WR 95 p. 23 for abstract of related article.

Conn, Hugh R. (Indian Affairs Branch, Ottawa, Ont.) INDIAN TREATIES AS RELATED TO GAME MANAGEMENT IN CANADA. Trans. NE. Wildl. Conf., 1: 183-190. 1958 (1959).

Henika, F. S. (US F&WS, Wash., D. C.) THE ROLE OF RIVER BASINS STUDIES IN WATER RESOURCE DEVELOPMENT. Trans. NE. Wildl. Conf., 1: 165-172. 1958 (1959).

Hine, Ruth L., editor. RESEARCH IN WISCONSIN / A TECHNICAL DIGEST OF RESEARCH RESULTS IN FISH, FOREST AND GAME MANAGEMENT (1957-58). Wis. Cons. Dept. ii + 104 p. 1959.

These digests of research projects of the Wis. Cons. Dept. are intended to inform agency personnel and the public as to activities and their results in the last 2 years. Similar digests may be issued about once a year. The summaries are preliminary reports, not formal publications. The present volume has sections on fisheries, forestry, and game management. Each section presents a brief introduction, digests of all current projects, references to recent publications, and a list of research personnel. The section on game discusses 45 projects or subprojects. Accounts of projects vary in length from a few lines to about a page. Among the subjects are upland game birds and their management, various surveys, use of herbicides, waterfowl, muskrat, beaver, and studies of forests in relation to deer.

Latham, Wm. H. (Power Authority State N. Y., N. Y. 19, N. Y.) CONSERVATION ASPECTS OF ST. LAWRENCE POWER PROJECT. Trans. NE. Wildl. Conf., 1: 20-25. 1958 (1959).

MacLennan, J. M., translator. TRANSLATIONS OF RUSSIAN HUNTING PAPERS FROM CZECH MAGAZINE "MYSLIVOST". Can. Wildl. Serv. 12 p., processed. Single copies of transl. available on request to Can. Wildl. Serv., Ottawa, while supply lasts.

1. Ramkov, F. FORTY YEARS OF SOVIET HUNTING AND GAMEKEEPING ECONOMY. Myslivost (Hunting & Gamekeeping) 5(35), no. 11: 163-164. Nov. 1957.

Tells briefly what contribution the hunting and gamekeeping associations of the USSR make to the national economy, and describes the recreational facilities available to a hunters' collective at one of the huge state farms where game is emphasized.

2. Lavrov, N. THE SIGNIFICANCE OF THE FORTY YEARS ENRICHMENT OF THE GAME AND INDUSTRIAL FAUNA IN THE U.S.S.R. Myslivost 5(35), no. 11: 164-166. Nov. 1957.

In 40 years, over 241,000 animals of 36 species were released in the USSR as introductions or restockings. Some failed completely. Muskrats succeeded well

and now occupy more range in USSR than in USA. Am. mink also has done well. Raccoons are being trapped in some areas and stocking continues in other areas. Nutria were acclimated to the Russian climate only after much work. Restocking of native beaver has gone well and trapping will begin soon. Sables were re-established on commercial basis by preserves and transplants. Raccoon-dog was moved to new regions and its range vastly increased; more pelts are taken from the new range than the old. Common hares were established in several districts of Siberia, but only after some difficulty. Bison were preserved in 4 reservations. Red deer, also nearly extinct, were preserved in several areas. Various ungulates, and hybrids of them, were transplanted to new locations, apparently on a trial basis. Several kinds of game birds were stocked for hunting in a variety of places.

3. Anon. A SHORT VISIT INTO SOVIET HUNTING GROUNDS. Myslivost 5(35), no. 11: 166-167. Nov. 1957.

Describes types of hunting grounds, and hunting methods, in diverse parts of the USSR. Some of the methods are interesting by contrast with ours. Also, it seems odd to read about shooting waterfowl at night, in the spring, and on the water.

Mair, W. Winston. (Can. Wildl. Serv., Ottawa, Ont.) CANADIAN ADMINISTRATIVE, MANAGEMENT AND RESEARCH PROBLEMS IN THE WILDLIFE FIELD. Trans. NE. Wildl. Conf., 1: 14-19. 1958 (1959).

Parsons, S. H. (Ont. Dept. Lands & For., Toronto.) PROCUREMENT AND TRAINING OF FISH AND WILDLIFE STAFF IN ONTARIO. Trans. NE. Wildl. Conf., 1: 191-195. 1958 (1959).

Solman, V. E. F. (Can. Wildl. Serv., Ottawa, Ont.) THE STRUCTURE OF WILDLIFE ADMINISTRATION IN CANADA. Trans. NE. Wildl. Conf., 1: 174-178. 1958 (1959).

TRANSACTIONS OF THE NORTHEAST WILDLIFE CONFERENCE / Tenth Annual Meeting / Montreal, Que., Canada / January 4, 5, 6, 7, 1958. Vol. 1. Office of Biol. of Dept. Game & Fisheries, U. Montreal, Quebec. 11 + 402, illus. 1959. $2.00, paper, from Office of Biology, G3, U. of Montreal, P. O. Box 6128, Montreal 3, Quebec.

The NE. Wildl. Conf. met 9 times before the Montreal meeting, but never before were the transactions formally published. The present publication, therefore, is volume 1. It is an impressive and well multilithed book. The table of contents lists 104 papers, summaries, and reports. Many of these are handled individually in this issue of WR. Numerous papers deal with fisheries and aquatic biology. Numerous others report (or summarize) technical wildlife studies. The section on Information and Education consists of 9 papers that should be of value to specialists in that field. Six papers take up problems and policies of conservation law enforcement. In addition, 9 associations present reports and/or 1 or 2 papers each. The volume is compact, considering the amount of material it contains, and merits a place in every well-used wildlife library.

U. S. Government. CUMULATIVE POCKET SUPPLEMENT TO THE CODE OF FEDERAL REGULATIONS. TITLE 50 - WILDLIFE. Govt. Printing Office. xv + 231 p. 1959. 75¢ from Supt. Documents, Wash. 25, D. C.

Brings federal wildlife regulations up to date as of Jan. 1959, but must be used with Title 50, 1949 edition to be comprehensible and complete. Includes laws relating to Fish and Wildlife Service (hunting and possession of wildlife, management of wildlife conservation areas), Alaska Game Commission (wildlife protection, commercial fisheries, aquatic mammals other than whales), and International Regulatory Agencies (Fishing and Whaling).

Wildlife Management Institute. THE WILDLIFE OF NEWFOUNDLAND. Dept. Mines & Resources, St. John's, Newf. 1-39 p. 1955.

The "Gabrielson Report" on Newfoundland. Discusses changes in policies and organization that are needed for the Wildlife Division, and considers some of the biological problems that merit further work. Studies needed for management of ptarmigan and caribou are outlined. If predator control is needed, government hunters are recommended. Whitetail deer should not be introduced, owing to

competition with the good moose herd. Proposed for introduction are: ruffed grouse, spruce grouse, and red squirrel, the last chiefly as marten fodder, partly for its own slight fur value. Suggestions are given for setting up law enforcement and information units. Selection of personnel is discussed and a salary scale is proposed.

WILDLIFE--HUNTING AREAS & PROBLEMS

Osler, P. F. (Quebec Wildl. Cons. Assn., Montreal.) OBSERVATIONS ON THE BACKGROUND AND PROSPECTS FOR SHOOTING AND FISHING IN NORTH AMERICA. Trans. NE. Wildl. Conf., 1: 366-373. 1958 (1959).

Osler argues at length that free hunting is getting scarcer and poorer every day. The cure as he sees it is pay-as-you-go hunting, especially on shooting preserves, but also on public and private lands that are managed for game production and on which hunting is regulated.

WILDLIFE--FOOD HABITS & TECHNIQUES

Constantine, Denny G., Jens A. Jensen, and Ernest S. Tierkel. (P. O. Box 552, State Coll., N. M.) THE USE OF RADIOLABELING IN DETERMINING PREY-PREDATOR RELATIONSHIPS. J. Mamm. 40(2): 240-242. May 1959.

Radioactive phosphorus-32 was injected into bats and the bats were fed to carnivores. Duration of retention of absorbed phosphorus in carnivores was proportional to doses administered to bats. Carnivores eating bats injected 8 days earlier were radioactive at least 1 week later. Limited evidence suggests that lowered metabolic rate in bats decreases phosphorus elimination. Radiolabeling will not provide conclusive proof of existence or nonexistence of predation unless accompanied by autopsy or fecal confirmation.--D. G. Constantine.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Keener, John M. (Wis. Cons. Dept., Madison.) WISCONSIN'S PREDATOR CONTROL PROGRAM. Wis. Cons. Bul. 24(6): 3-10, 11 photos. June 1959.

Wisconsin has joined the states adopting the extension trapper system. Each of the 5 game management areas of the state will have 1 or more trapper training specialists who will teach landowners to do their own trapping. No other system is deemed nearly so satisfactory. The article includes a photo story on how to make 1 type of fox set.

McDowell, Robert D., and Harold W. Pillsbury. (U. Conn., Storrs.) WILDLIFE DAMAGE TO CROPS IN THE UNITED STATES. J. Wildl. Mgt. 23(2): 240-241. Apr. 1959.

To make an appraisal of crop damage caused by wildlife, a questionnaire was sent to all state game agencies in the U. S. in 1957. All replied. Answers are summarized in this paper. Crops damaged, in descending order of importance, were: grains, orchards, vegetables, tree plantations, improved pastures, ornamentals, hays, berries, and fruits. The most destructive species, or groups of species, in order of importance, were: game mammals, nongame mammals, game birds, and nongame birds. Thirty-two states reported that deer were a special problem. Ten states indicated that deer damage was slight or local. Only six states indicated that deer were no problem. Most indicated that they had found no effective method of deer control other than shooting. Ten states are making regular payments for damage caused by game animals. Respondents indicated that eleven methods were being used to minimize or to prevent crop damage. These methods were rated by the respondents. Shooting and trapping were the most popular. Fifteen states reported that they had research under way on crop damage.--Authors.

Storer, Tracy I. CONTROLLING FIELD RODENTS IN CALIFORNIA. Calif. Agr. Exp. Sta., Cir. 434 (Revised). 1-50 p., illus. Oct. 1958.

Replaces the former Extension Circular 138. "It is intended to aid in the control of field rodents on farms and in home gardens. It describes the animals, tells where and how they live, and what they eat... It describes the control methods, including the use of poison baits and poisonous gases, trapping, shooting, exclusion, and encouragement of natural enemies. It gives instructions for applying these controls, and formulas for the poisons recommended. Section 1 deals with rodent damage and means of control, Section 2 with ground squirrels and tree squirrels, Section 3 with pocket gophers and moles, and Section 4 with meadow mice, kangaroo rats, muskrats, and rabbits."

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Aldous, Shaler E., editor. SURVEY OF PITTMAN-ROBERTSON ACTIVITIES, 1958. US F&WS Cir. no. 56. 1-203 p. Mar. 1959.

An extremely valuable reference for those who need a list of all state PR projects. Each project of a state is listed by title and number, its leaders are listed, and its objectives are stated. Another valuable feature, begun only the previous year, is the tabulation of small game kill; this is given by states and by species or group. Interesting "Highlights" of selected projects are summarized in the front of the volume; these are well worth 15 minutes of any wildlifer's time. A tabulation on pages 23-39 shows the types of publications and subject matter of publications that have come from PR projects in the years 1938-58. Recent PR publications are cited for each state in another section. The back of the book provides addresses of all state game departments and a subject index.

Branch of Federal Aid, Fish & Wildlife Service. FEDERAL AID IN FISH AND WILDLIFE RESTORATION. ANNUAL REPORT ON DINGELL-JOHNSON AND PITTMAN-ROBERTSON PROGRAMS FOR THE FISCAL YEAR ENDING JUNE 30, 1958. Wildl. Mgt. Inst. (Wire Bldg.) and Sport Fishing Inst. (Bond Bldg.), Wash. 5, D. C. iv + 62 p., illus. 1959.

The bulk of this report is a list, by states, of all PR and DJ projects, with brief descriptions and statements of costs. One table reports on land purchases approved during the year. Other tables present financial statements for both programs. A special pictorial feature deals with stocking and tells what stocking has been done under Federal Aid.

California. FORTY-FIFTH BIENNIAL REPORT, CALIFORNIA DEPARTMENT OF FISH AND GAME, 1956-1958. 1-95 p., illus. 1959?

The bulk of this long report consists of interestingly presented but rather brief and general accounts of individual projects and problems. Quantitative reference material is concentrated in the appendices. There, in addition to many tables on finances and fisheries and water projects, are tables on the following game matters: economic survey of hunter and fisherman expenditures in 1955; game kill, by species or group, each year, 1954-7; hunting statistics for pheasant and waterfowl management areas; game farm releases; results of controlled deer hunts; regular buck kill, by counties; and game lands owned or leased.

Idaho. TWENTY-SEVENTH BIENNIAL REPORT OF THE FISH AND GAME DEPARTMENT OF THE STATE OF IDAHO, JULY 1, 1956 TO JUNE 30, 1958. 96 p., illus. 1958?

Provides general picture of many of the Department's activities, such as studies of big game and their range conditions, work done in habitat improvement, predator-control activities, and functions of the Coop. Wildl. Res. Unit. It also discusses hunting and regulatory policies for big game species. Tables report kill of deer, elk, moose, bear, mtn. goat, bighorn, and pronghorn, as well as the catch of fur animals. Other tables present figures on: pheasant sex ratios, pheasant hunting statistics, sage grouse hunting statistics, results of winter inventories of waterfowl, and production of game farm.

New Jersey. ANNUAL REPORT OF DIVISION OF FISH AND GAME FOR THE FISCAL YEAR COMMENCING JULY 1, 1957 AND ENDING JUNE 30, 1958. 1-68 p., illus. [1959.]
The section on wildlife management reports an increase in number of hunters since the previous year and increased wildlife populations. Harvest of pheasants increased 64%. Harvest of rabbit, quail, and deer also increased, but harvest of squirrel and ducks decreased. Research projects are reviewed briefly, and work done on management of deer, farm game, and other management projects is listed.

Nova Scotia. REPORT OF THE DEPARTMENT OF LANDS AND FORESTS, FISCAL YEAR ENDING MARCH 31, 1958. Queen's Printer, Halifax. 28 p. 1958.
The section on game, p. 20-25, is chiefly tabular. The number of bears bountied from 1947 to 1957 declined from 409 to 164. The number of deer that could be taken per license was reduced from 2 to 1 in 1957; the kill dropped from 34,332 in 1956 to 21,065 in 1957. Tables of data are also given on: number of pelts exported, by species; deer kill, 1950-57; and moose kill, 1924-37.

WETLANDS & WILDLIFE

Arasaki, S. THE ECOLOGY OF AMAMO (ZOSTERA MARINA) AND KOAMAMO (ZOSTERA NANA). Bul. Japanese Soc. Sci. Fisheries, 15(10): 567-572. 1950. Fisheries Research Board of Canada, Translation no. 60, 9 p., typescript, available on interlibrary loan from Biological Station, St. Andrews, N. B.

Arasaki, S. STUDIES IN THE ECOLOGY OF ZOSTERA MARINA AND ZOSTERA NANA (2). Bul. Japanese Soc. Sci. Fisheries 16(2): 70-76. 1950. Fisheries Research Board of Canada, Translation no. 61, 19 p., typescript, available on interlibrary loan from the Biological Station, St. Andrews, N. B.

Bartley, T. R. (US Bur. Reclamation, Federal Center, Denver, Colo.) PHYSICAL AND CHEMICAL PROPERTIES INDICATIVE OF GOOD HYDROCARBON SOLVENTS FOR AQUATIC WEED CONTROL IN IRRIGATION SYSTEMS. Proc. 16th W. Weed Control Conf.: 34-39. Mar. 1958.

Boschetti, Mario M. (Mass. Dept. Public Health, 16 Emerson St., Reading, Mass.) FIELD TESTING OF KURON AS AN AQUATIC HERBICIDE IN MASSACHUSETTS. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 315-321. Jan. 1959.
Detailed report of many tests. Kuron shows great promise as an aquatic herbicide. It is effective against most aquatic plants at contact concentrations of 2 ppm. Notable exceptions are Potamogeton and Sparganium. Kuron seems to have some residual effect, for cleared areas have remained clear for more than 1 season.

Dane, Charles W. (Cornell U., Ithaca, N. Y.) SUCCESSION OF AQUATIC PLANTS IN SMALL ARTIFICIAL MARSHES IN NEW YORK STATE. N. Y. Fish & Game J. 6(1): 57-76, 8 figs. Jan. 1959.
In 1956, Dane studied 22 previously studied marshes, 11 in each of 2 contrasting regions.
The Southern Tier Region was more sterile and acid. Here woody plants were largely flooded out. Emergent plants did not invade well enough to provide cover. Emergent food plants were few in kind and low in numbers. Sparganium was becoming abundant at a few sites. Lemna minor formed mats in some marshes. Potamogeton foliosus became established, then declined within 5 years. Low transparency of water limited growth and depth of invasion of submergents in several marshes. Total alkalinity was important: marshes with less than 30 ppm. had little vegetation; regional av. was 46 ppm. Many marshes had steep slopes, which did not favor vegetation. In this region, construction of marshes should be coordinated with experimentation to develop suitable management methods.
In the region of Genessee and Niagara counties the soils were more fertile and limey. Here less flooding and more natural summer drawdown allowed woody cover to live. Emergents, especially cattail, invaded extensively. As in the acid region, emergent food plants were few in kind and number. Lemna mats were

usually absent. Potamogeton foliosus and P. pectinatus were usually abundant where emergents were not crowded. Av. total alkalinity was favorable, 84 ppm. Marshes were shallower and often became crowded with emergents in years of low water. In this region the rapid progress of drainage indicates the need of full development and acquisition of marsh lands.

Dansereau, Pierre. (U. Montreal, Quebec.) VASCULAR AQUATIC PLANT COMMUNITIES OF SOUTHERN QUEBEC. A PRELIMINARY ANALYSIS. Trans. NE. Wildl. Conf., 1: 27-54, 17 figs., 7 tables. 1958 (1959).

Eipper, Alfred W. (Dept. Cons., Cornell U., Ithaca, N. Y.) EFFECTS OF FIVE HERBICIDES ON FARM POND PLANTS AND FISH. N. Y. Fish & Game J. 6(1): 46-56. Jan. 1959.

Delrad, Fermate, Phygon-XL, copper sulfate, and sodium arsenite were tested. Results are reported for 70 applications to 30 ponds. Physical conditions of the ponds are specified. When applied as surface sprays to produce 0.5 ppm. active ingredient by weight, Delrad, Fermate, and copper sulfate were equally good in controlling unbranched filamentous algae. Of these 3, copper sulfate had definite advantages in cost and safety to small fish. Tests of Phygon in 7 ponds proved only that 0.25 ppm. killed neither plants nor fish. Sodium arsenite at 4 ppm. did no visible harm to fish but controlled the resistant algae Hydrodictyon and Cladophora, other algae, and various rooted aquatics. "Information on the effects of different concentrations of Delrad on three types of algae and two age groups of minnows was obtained in 10 ponds, together with physical-chemical determinations. The inconclusive nature of these data, due primarily to the confounding of a number of variables, clearly demonstrates the need for careful experimental design in planning field tests of aquatic herbicides, with adequate provisions for controls, replicates, and measurements of results."

Fitzgerald, C. P. (U. Wis., Madison.) THE CONTROL OF THE GROWTH OF ALGAE WITH CMU. Trans. Wis. Acad. Sci. Arts & Letters 46: 281-294. 1957. [From Biol. Absts. 33(8), from Weed Abst. 7(11).]

See long abstract in Biol. Abst. 33(8).

Goodrum, Phil D., and Charles E. Gray. (816 Sarah Ann, Nacogdoches, Texas.) EXPERIMENTAL CONTROL OF GIANT CUTGRASS IN EASTERN TEXAS. Down to Earth 14(3): 10-12, illus. 1958. [From Biol. Abst. 33(7).]

Zizaniopsis miliacea, a common pest in southern ponds and lakes, grows in wet soil and in water up to 3 feet deep. It spreads by means of seeds and runners up to 14 feet long. Trials were conducted in 1955-57 with Dalapon, using dosages of 10, 20 and 40 pounds per acre. Water was used as a solvent and carrier, with 30 ounces of a detergent to 100 gallons of solution. Best results were obtained from late spring application before full growth was attained and the water table was lowered as far as possible to provide for maximum wetting of the foliage with the least dosage (75-125 gallons per acre). A 20-pound per acre application effected 95-99% control, there being only 1% regrowth when water level was lowered enough to expose the crowns.--From abst. by V. R. Gardner.

Greeley, John R., and John H. Steenis. (N. Y. Cons. Dept., Albany.) COMPARATIVE TESTS OF VARIOUS HERBICIDES ON WATERCHESTNUT. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 299-305. Jan. 1959.

Of the many materials tested, only 2,4-D in formulations of attaclay and vermiculite granules gave a complete kill characterized by no regrowth. Results with vermiculite containing a soluble form of 2,4-D (amine salt) suggest that perhaps attaclay pellets impregnated with more soluble or emulsifiable forms than those tested merit further attention. Improvement in surface sprays might be expected through changes in specific gravity to provide a slow sinking material. One test in this direction involving the addition of triethanolamine indicated good possibilities.

Jackson, Harry O., and Wm. C. Starrett. (Ill. State Normal U., Normal.) TURBIDITY AND SEDIMENTATION AT LAKE CHAUTAUQUA, ILLINOIS. J. Wildl. Mgt. 23 (2): 157-168, 2 figs. Apr. 1959.

Study was made of causes and effects of resuspension of sediment particles at Lake Chautauqua, a 3,562-acre, shallow, lateral reservoir lake along the Ill. R. Turbidity determinations were made with a Jackson turbidimeter for 346 water samples and 156 water-transparency readings were taken with a Secchi disk. Turbidity ranged from less than 25 p.p.m. to 800 p.p.m. Sago pondweed (Potamogeton pectinatus) is now the only submergent plant that ever occurs abundantly in the lake and its abundance varies with water levels. Water motion produced by wind caused an increase in turbidity in the absence of pondweed or ice cover (water depth less than 4.8 feet). Under such conditions, turbidity tended to vary with wind velocity. Disturbance of the bottom by fish increased turbidity of the lake. Commercial removal of 2,022,965 pounds of fish from the lake during an 8-year period had no apparent effect upon vegetation or turbidity. --Authors.

Jobbins, Daniel M. (Rutgers U., New Brunswick, N. J.) ARE WILDLIFE MANAGEMENT AND MOSQUITO CONTROL COMPATIBLE? Trans. NE. Wildl. Conf., 1: 173. 1958 (1959). [Abstract only.]

"There must be a wider application of research findings as regards the utilization of wetland resources through mosquito control and other conservation measures. Mosquito control must be conducted in such a manner as to minimize hazards to wildlife from insecticides and undesirable plant successions. This means that the various conservation disciplines must study the problems involved in order to arrive at mutually advantageous solutions."--Complete.

McKeon, W. H. (N. Y. Cons. Dept., 311 Mill St., Poughkeepsie.) A PRELIMINARY REPORT ON THE USE OF CHEMICAL HERBICIDES TO CONTROL PURPLE LOOSESTRIFE (LYTHRUM SALICARIA) ON A SMALL MARSH. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 329-331. Jan. 1959.

None of the compounds tested gave satisfactory degree of control.

Office of River Basin Studies. INVENTORY OF PERMANENT WATER AREAS OF SIGNIFICANT VALUE TO WATERFOWL IN THE STATE OF MAINE. US F&WS, 1105 Blake Bldg., 59 Temple Pl., Boston 11, Mass. 1-7 p., 2 maps. Mar. 1959.

Present land-use practices in Maine do not pose an immediate threat to the 160,675 acres of significant-value wetlands that were reported in the original wetlands inventory, nor are the 602,765 acres of permanent water of significant value to waterfowl considered as being vulnerable to destruction. The delineation of permanent water areas of significant value to waterfowl, as outlined in this report, should prove helpful in developing any long-range program for the maintenance of adequate waterfowl habitat in Maine.--From auth. summ. Table and maps help present the factual data.

Pierce, Madelene E. (Vassar Coll., Poughkeepsie, N. Y.) FURTHER STUDY OF THE EFFECT OF THE WEEDICIDE KURON UPON THE FLORA AND FAUNA OF LONG POND, DUTCHESS COUNTY, NEW YORK. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 310-314. Jan. 1959.

Treatment of a 2-acre plot at rate of 2 ppm. caused good control of emergent plants for the season. Effects on submerged plants varied from much to little, depending on site, with least effects on dense growths of Potamogeton in deep water. Effects on fauna were limited to temporary alterations in planctonic populations. Much regrowth of plants occurred in next year.

Schneider, Edwin O. (Geigy Chem. Co., 705 Sunset, Naperville, Ill.) A PROGRESS REPORT ON SIMAZINE FOR AQUATIC WEEDS. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 306-309. Jan. 1959.

Simazine appears promising as a herbicide for the control of many aquatic species without injury to fish or fish food organisms at rates as high as 10 lbs. active per acre. The most successful treatments have been in areas of little or no run-off and where the entire area could be treated at one time. Spot treatments with granules appeared promising in limited tests in large ponds.--Auth. summ.

Smith, Lawrence S. (US F&WS, R. D. 1, Basom, N. Y.) SOME EXPERIENCES WITH CONTROL OF PURPLE LOOSESTRIFE AT THE MONTEZUMA NATIONAL WILDLIFE REFUGE. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 333-336. Jan. 1959.

Ammate killed loosestrife satisfactorily in both wet and dry situations. Hand pulling was good for scattered individual plants growing in water, but it simply broke stems of those growing on land. Loosestrife has continued to expand its grip on the refuge by means of many scattered individual plants that cannot be treated effectively. Elimination would be virtually impossible. Management of impoundments by drawdown is threatened because drawdown would give loosestrife a chance to take hold over all parts of impoundments.

Sorrels, J. H., and P. J. A. Zeller. CHEMICAL TREATMENT READILY CLEARS PONDS AND TANKS OF ALGAE WITHOUT HARM TO FISH. Texas Engin. Exp. Sta. News 9 (2): 6-7. June 1958. [From Weeds 7(2).]

Springer, Paul F., assembler. (Patuxent Refuge, Laurel, Md.) [CONTROL OF AQUATIC PLANTS WITH HERBICIDES.] Suppl. to Proc. 13th Ann. Meeting NE. Weed Control Conf. p. 91-108. Jan. 1959.

Long and useful set of tabulated data on results of trials of many kinds of chemicals on many kinds of aquatic plants. Other sections of the supplement contain similar compilations for woody plants, highways, and various crops.

Steenis, John H., Everett B. Chamberlain, and Robert A. Beck. (Patuxent Refuge, Laurel, Md.) RECENT DEVELOPMENTS IN PHRAGMITES CONTROL. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 293-298. Jan. 1959.

Tests of chemical methods for control of phragmites were made in Delaware marshes in the summers of 1955-58. These investigations...revealed that a mixture of dalapon and amitrol was superior to either herbicide used alone. Most effective and least expensive control on dry sites was obtained from an application of mixtures of dalapon at 10 lb/A with amitrol at 2 lb/A. Uniformly good control on wet sites resulted from a mixture of dalapon at 25-30 lb/A with amitrol at 4-5 lb/A which was applied during the flowering and early fruiting period. Effective control of phragmites with lesser amounts of herbicide is possible in other locations where the growth of this grass is less vigorous. In many areas, aerial application of herbicide is the only way in which phragmites can be controlled. Requirements for airplane application are avoidance of damage to nearby croplands and correct calibration of equipment. To be economical, treatments should be completed in a single flight.--Auth. summ.

Steenis, John H., Lawrence S. Smith, and Henry P. Cofer. (Patuxent Refuge, Laurel, Md.) STUDIES ON CATTAIL MANAGEMENT IN THE NORTHEAST. Trans. NE. Wildl. Conf., 1: 149-155. 1958 (1959).

Invasion by cattail seedlings after drawdown was partly controlled by competition with desirable plants. Water-level manipulation was more effective: cattails less than 1 year old were killed when water was held 18 in. deep from early spring into midsummer. Cattails in their 2d year remained healthy but did not spread in water 18-20 in. deep. There was partial kill of well established broadleaf cattails in water 20-25 in. deep, and at depths over 25 in. the kill was complete.

2,4-D mixed with TCA was fairly effective in controlling narrowleaf cattail. Dalapon and mixtures of dalapon with CPA or 2,4-D killed 70-90%. ATA gave nearly 100% control of narrowleaf, broadleaf, and blue cattails. Mixtures of ATA with dalapon were equally effective and less expensive. Other chemicals were less effective.

Cattails help waterfowl in some areas by providing needed cover. They may protect dikes from wave and ice action. When openings in a marsh are created by man, muskrats may enlarge or maintain them. Small openings are used readily by breeding waterfowl, but larger areas--1/4 acres or more--are preferred by migrating or wintering ducks. Openings planned for hunting should be of at least 1 acre.--From auth. summ.

Stevenson, Robert E., and K. O. Emery. MARSHLANDS AT NEWPORT BAY, CALIFORNIA. U. of S. Calif. (Los Angeles), Allan Hancock Found. Publ., Occ. Pap. no. 20. iv + 109 p., 50 figs. Sept. 1958. $2.00, paper, from U. of S. Calif. Press, Los Angeles.

Fundamental study of a coastal marsh that has been much altered by man. Chapters deal with physiography, water characteristics, sediments, plant communities and factors affecting their distribution, and conclusions. Conclusions are discussed under the headings: Conditions controlling marsh growth, Stability of platform, Age of the marshes, and Ancient marsh deposits. Bibliography of 17 pages.

Trimble, Otis M., and Walter L. Criley. REELFOOT. PLAN FOR COMPREHENSIVE DEVELOPMENT. Tenn. State Planning Comm. (C1-118 Cordell Hull Bldg., Nashville) Publ. no. 291. v + 85 p., 9 maps, 8 photos. Oct. 1958. $1.00, paper.

Tenn. officials have long considered Reelfoot Lake a neglected resource, a conservation sore spot. Opposing interests, however, and problems of cost have blocked most remedies. Here is a detailed account, appraisal, and plan. It discusses the origin of the lake, tells what Reelfoot and its surroundings are like today, and describes how the lake is filling with silt and vegetation. It then discusses each remedial measure that has been proposed and weighs its pros and cons. Existing and potential recreational values of Reelfoot are considered with the conclusion that much development is justified, but that wildlife and other natural and esthetic values must be retained. Large areas, already in state and federal management, are to be reserved for wildlife, with a few changes of boundaries. Other areas are to be devoted to state parks, private ownership, or the biological station. Transportation facilities are to be improved and the esthetic quality of the region is to be improved in various ways.

Younger, R. R. (Halco Chem. Co., 1 Prospect Pl., Freehold, N. J.) A PRELIMINARY REPORT ON CONTROLLING AQUATIC VEGETATION IN NEW JERSEY WITH KURON. Down to Earth 13(4): 2-3. 1958. [From Biol. Abst. 33(7).]

Applications were made as sprays to wet the foliage. Concentrations of 0.2-3.5 ppm were employed and one gallon of this dilution was used to each estimated 1,000,000 gallons of pond water. Concentrations of 2-2.5 ppm gave complete control of white water lily, yellow water lily, mud plantain, water milfoil, fanwort, and bladderwort, but not of pondweed or duckweed. There was no injury to shoreline tree species. There was no injury to fish. Kuron is relatively slow acting, treated plants beginning to wilt or curl in 7 days and to disintegrate after 14 days.--From abst. by V. R. Gardner.

Younger, Roy R. (Halco Chem. Co., 1 Prospect Pl., Freehold, N. J.) PROGRESS REPORT ON THE USE OF KURON, 2,4-D AND 2,4,5 TP GRANULES AS AQUATIC HERBICIDES. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 322-328. Jan. 1959.

Results are reported in tables and discussed in text. Kuron apparently yields longer periods of control than other herbicides. More tests should be made of spraying the exposed bottom with this chemical. The 2,4-D and 2,4,5 TP granules have the advantage of easy, local distribution without special equipment. Granules should have a definite place in control of aquatic weeds if they can be improved and rate of application can be determined.

FARMLAND & WILDLIFE

Allan, Philip F. (US Soil Cons. Serv., Ithaca, N. Y.) WILDLIFE PRACTICES IN THE NORTHEAST SOIL BANK PROGRAM. Trans. NE. Wildl. Conf., 1: 179-182. 1958 (1959).

RANGELAND & WILDLIFE

Aikman, J. M., and Robert F. Thorne. (U. Iowa, Iowa City.) THE CAYLER PRAIRIE: AN ECOLOGIC AND TAXONOMIC STUDY FOR A NORTHWEST IOWA PRAIRIE. Proc. Iowa Acad. Sci. 63: 177-200, map, illus. 1956. [From Biol. Abst. 33(6). No abstract.]

Blaisdell, James P. SEASONAL DEVELOPMENT AND YIELD OF NATIVE PLANTS ON THE UPPER SNAKE RIVER PLAINS AND THEIR RELATION TO CERTAIN CLIMATIC FACTORS. US Dept. Agr., Tech. Bul. no. 1190. iii + 68 p., 15 figs. Nov. 1958.
Detailed report based on 23 years of study of ungrazed plots near Dubois, Idaho.

Brown, Ellsworth R. (Wash. State Dept. Game.) BUCK BRUSH. Wash. State, Game Bul. 11(2): 4-5, 7, 2 photos. Apr. 1959.
Report of browse-restoration research in Wash. Many kinds of shrubs, native and exotic, have been tried. Eighteen kinds have been tentatively selected, 6 suitable for any cultivated dryland site, 10 for planting on good cultivated dryland sites, and 2 for moist cultivated sites. These 18 are listed. Bitterbrush (Purshia tridentata) has received most attention. Efforts to grow it from seed in the wild encountered many difficulties. Now seed is protected from rodents by chemical treatment. Competition with grass is overcome by use of dalapon; this also helps greatly by leaving mulch of dead grass to protect soil from baking or cracking. About 2,000 acres have been planted to bitterbrush and some plantings have been highly successful. Some of the remaining problems are listed.

Dietz, D. R., R. H. Udall, H. R. Shepherd, and L. E. Yeager. (US F&WS, Colo. State U., Ft. Collins.) SEASONAL PROGRESSION IN CHEMICAL CONTENT OF FIVE KEY BROWSE SPECIES IN COLORADO. Proc. Soc. Am. For. Meeting 1958: 117-122, 6 graphs. 1958 [1959].
Samples of big sagebrush, bitterbrush, mtn. mahogany, Gambel oak, and serviceberry were collected in or near Mesa Verde Natl. Park, Colo., and were analyzed chemically. Results are reported in detail. Season of collection affected amount of protein, carotene, phosphorus, fat, and fiber. It had little effect on nitrogen-free extract, ash, and calcium. Late spring samples were somewhat higher in protein than the av. of other seasons. They were definitely higher in phosphorus and carotene. Sagebrush had the highest seasonal mean % of protein, phosphorus, and fat. It had the lowest mean % of fiber, nitrogen-free extract, and calcium. Oak and serviceberry had wide calcium-phosphorus ratios in late fall and late winter, when they are little used. Bitterbrush and mtn. mahogany had wide calcium-phosphorus ratio in late spring and late summer, when they have relatively light use by deer. Deer were observed to choose browse that contained the highest amounts of important nutrients at each season. This was especially true of protein content. No 1, 2 or 3 browse species can supply a sound, year-around diet; deer range must contain balanced mixtures of various preferred browse species. Sagebrush was the only browse species studied that maintained all nutritive values through winter. In fact, sagebrush gained protein content in winter and received increased deer use. The importance of sagebrush in winter diet of deer must be emphasized. Sagebrush-eradication programs should be scrutinized with care. "The elimination of large areas of sagebrush on critically needed deer winter ranges could be the beginning of the end for many deer herds in the West."

Gratkowski, H. EFFECTS OF HERBICIDES ON SOME IMPORTANT BRUSH SPECIES IN SOUTHWESTERN OREGON. US For. Serv., Pac. Nw. For. & Range Exp. Sta. (Portland, Ore.), Res. Pap. 31. iii + 34 p., illus. Mar. 1959.
Reports tests of 6 herbicides on 13 kinds of brush. Low volatile esters of 2,4-D and 2,4,5-T were the most effective herbicides. Brush species varied in response from highly susceptible to highly resistant. Spraying recommendations are tabulated.

Herbel, Carlton H., and Kling L. Anderson. (Kans. State Coll., Manhattan.) RESPONSE OF TRUE PRAIRIE VEGETATION ON MAJOR FLINT HILLS RANGE SITES TO GRAZING TREATMENT. Ecol. Monog. 29(2): 171-186, 3 figs. Apr. 1959.

Range Seeding Equipment Committee, U. S. Depts. Agriculture & Interior. HANDBOOK / CHEMICAL CONTROL OF RANGE WEEDS. US Govt. Printing Office. vi + 90 p. Revised Jan. 1959. $1.00 from Supt. Documents.
Well-prepared, loose-leaf reference that gives specific recommendations (and references) for control of 3 kinds of grasses, 20 kinds of forbs, and 21 kinds of woody plants.

Ray, Raymond J. (Cherry Creek High Sch., Englewood, Colo.) A PHYTOSOCIOLOGICAL ANALYSIS OF THE TALL-GRASS PRAIRIE IN NORTHEASTERN OKLAHOMA. Ecology 40(2): 255-261, 4 graphs. Apr. 1959.

Smith, Arthur D. (Utah State U., Logan.) CONSIDERATIONS AFFECTING THE PLACE OF BIG GAME ON WESTERN RANGES. Proc. Soc. Am. For. Meeting 1958: 188-192, 1 fig. 1958 [1959].

Livestock does much more damage to game foods than game does to livestock foods. Indeed, game animals have been blamed for the work of cattle. Game does little damage to watershed values. On the other hand, game animals and hunters can be very real troubles to landowners. Relative economic values of game and stock are almost impossible to determine. On the basis of amounts spent all along the line from production to consumption, livestock meat is far more valuable than that of game. The intangibles, however, are very great and they favor game. Smith concludes that managers of public lands are obliged to give game substantial consideration. The Forest Service is doing so in part, the Bureau of Land Management very little. Both should realize, and should convince single-resource users [such as stockmen] that game is important on public land and should be considered seriously in land renovation schemes, some of which can be seriously adverse to game. Game administrators, of course, must accept the responsibility of keeping healthy herds on healthy ranges through adequate kills. Every effort should be made to keep private ranges open to game production and public use. This almost certainly will demand payments to landowners. We may not like this, but we must face it as a growing truth.

FORESTLAND--FORESTRY & ECOLOGY

Day, Maurice W. (Dunbar For. Exp. Sta., Sault Ste. Marie, Mich.) THINNING ASPEN IN UPPER MICHIGAN. Quart. Bul., Mich. Agr. Exp. Sta., 41(2): 311-320. Nov. 1958.

Moderately heavy thinnings have utilized a large proportion of the stand that would otherwise have been wasted through mortality. Thinning from below, leaving as few as 200 crop trees per acre, resulted in lowered mortality and increased growth. Thinning from above did not give the same desirable results. Non-commercial thinnings in young stands showed decreased mortality and increased growth as well as improved vigor in resisting effects of insect attacks. Results have been strongly influenced by insect attack, diseases, animal injury, and other conditions.--From auth. summ.

Little, Silas, H. W. Lull, Irwin Remson. (NE. For. Exp. Sta., Upper Darby, Pa.) CHANGES IN WOODLAND VEGETATION AND SOILS AFTER SPRAYING LARGE AMOUNTS OF WASTE WATER. For. Sci. 5(1): 18-27, 3 photos. Mar. 1959.

At Seabrook, N. J., a food-processing plant disposes of waste water by spraying it into upland woods at rate of 400-600 in. per year. After 7 years, most of the original vegetation has been killed--trees, shrubs, and herbs. In their place has developed a rank growth of elder and many herbs, chiefly smartweeds, pokeberry, lambsquarters, barnyard grass, and cornbinds. Soil changes are described. In general, the treated soils are more mull-like, perhaps because of a greatly increased earthworm population. The upper 6 in. contain more organic matter and much more soluble nitrogen and phosphorus. On the whole, the soil changes are beneficial. The forest floor is still protected by vegetation and the soil is expected to continue to permit the high rate of infiltration.

Russell, Norman H. (Grinnell Coll., Grinnell, Iowa.) NATURAL FORESTS OF THE EDMUND NILES HUYCK PRESERVE, NEW YORK. Proc. Iowa Acad. Sci. 62: 231-244, map. 1955. [From Biol. Abst. 33(6).]

Eleven forest areas were studied on the Edmund Niles Huyck Preserve in Albany County, New York, during the summer of 1953. Summaries of sampling data, obtained by the use of the random-pairs method, are given. In spite of closely similar land-use histories, physiographic situation, and local climates, each of the 11 forests is distinct from the others. In the absence of long-range studies of plant succession, it is concluded that evidence for the arrangement of these eleven forests into any sort of successional scheme is presently inadvisable.--Auth. summ.

Russell, Norman H. (Grinnell Coll., Grinnell, Iowa.) NATURAL SUCCESSION IN PLANTED CONIFER FORESTS IN EASTERN NEW YORK. Proc. Iowa Acad. Sci. 62: 223-230. 1955. [From Biol. Abst. 33(6).]

Sampling data from 10 red pine and white spruce plantations and from old fields were examined to attempt to fix the approximate stage of deciduous forest invasion in each. Though the old fields have actually had less direct disturbance by man in the last 30 years, they apparently changed very little in their composition during that time. On the other hand, deciduous forest species have very definitely begun the invasion of planted conifer forests here. Clearing of old fields and planting of red pine and particularly white spruce seems to have actually speeded up natural succession instead of hindering it. This may be because of the amelioration of certain environmental factors, such as temperature maxima and minima and evaporation rate, by the forest canopy and even significant extensions of the growing season for native tree species.--Auth. concl.

Skilling, D. D. GROWTH OF SWAMP CONIFERS FOLLOWING AN IMPROVEMENT CUT. US For. Serv., Lake States For. Exp. Sta. (St. Paul 1, Minn.), Sta. Pap. no. 71. 1 + 10 p., 5 figs. Apr. 1959.

Based on study of white-cedar swamp in Wis. Results are mainly of interest in forestry, but author mentions that browsing of young growth by snowshoe hare was a factor limiting reproduction of white cedar. The swamp was in a deer-management area, but deer did not affect reproduction appreciably, for they did not winter in this swamp.

Stoeckeler, J. H. TRAMPLING BY LIVESTOCK DRASTICALLY REDUCES INFILTRATION RATE OF SOIL IN OAK AND PINE WOODS IN SOUTHWESTERN WISCONSIN. US For. Serv., Lake State For. Exp. Sta. (St. Paul 1, Minn.), Tech. Notes no. 556. 2 p. Apr. 1959.

Weaver, Harold. (3505 N.E. Schuyler, Portland 13, Ore.) EFFECTS OF BURNING ON RANGE AND FORAGE VALUES IN THE PONDEROSA PINE FOREST. Proc. Soc. Am. For. Meeting 1958: 212-215. 1958 [1959].

Ponderosa pine and grass can be produced together very well. Overgrazing and exclusion of fire have resulted in dense jungles of brush and tree reproduction in which trees do not do well and grass is excluded. Prescribed burning thins out the woody plants, permits better tree growth, and results in plenty of grass. Once the excess of fuel is removed, fires creep through the forest, remaining low and harmless.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Adams, Lowell. (Calif. For. & Range Exp. Sta., Susanville, Calif.) CONFLICTS AND INTEGRATION IN THE MANAGEMENT OF FORESTS AND DEER. Proc. Soc. Am. For. Meeting 1958: 127-129. 1958 [1959].

Management of wild lands involves the simultaneous management of several products of the land. This results in both conflicts and complementary relationships. The challenge is to integrate multiple-resource management so that all products will be cultured at the mutually optimum level. Involved are policy, practice, and research in multiple use. Adams gives examples of the conflicts, of the complementary relationships, and of ways the problem can be approached.

Bailey, James. (1903 W. Melrose St., Chicago, Ill.) CONIFER PLANTATIONS AS HABITAT FOR RUFFED GROUSE AND OTHER WILDLIFE. Trans. NE. Wildl. Conf., 1: 239-257, 2 figs. 1958 (1959).

For informative review of mimeographed paper on which this publication is based, see WR 91 p. 36.

Buckley, John L. (Patuxent Refuge, Laurel, Md.) EFFECTS OF FIRE ON ALASKAN WILDLIFE. Proc. Soc. Am. For. Meeting 1958: 123-126. 1958 [1959].

Well-documented discussion of effects of wildfires in Alaska on hydrology, permafrost levels, topography, plant succession, and game. Direct destruction of animals by fire is much less important than the habitat changes caused by fire. Fire is the most important factor on Alaskan vegetation. Acreage burned has been substantially greater since 1900. Effects on wildlife are mixed. Caribou do best with climax lichen ranges; no doubt fire has contributed to their decline. Moose reproduction and numbers have increased on burns; moose probably are at record levels. Instances of waterfowl habitat being injured by fire and improved by fire are described.

Christ, John C. (State Teach. Coll., Peru, Nebr.) A STUDY OF YELLOW BIRCH (BETULA LUTEA) IN THE BOGS OF ITASCA PARK, MINNESOTA. Am. Midl. Nat. 61(2): 480-484. Apr. 1959.

Evidence that excessive populations of deer and beaver in the park completely prevented reproduction of this valuable tree. In the park, yellow birch is restricted to bogs and does not occur in uplands as it does over the main part of its range.

Halls, L. K. (S. For. Exp. Sta., New Orleans 13, La.) WILDLIFE HABITAT RESEARCH IN THE SOUTH: STATUS AND NEEDS. Proc. Soc. Am. For. Meeting 1958: 130-133. 1958 [1959].

"The increased pressure for recreational use of forest lands in the South dictates the expansion of research in game habitat. Assessment of wildlife potential and good management require an objective inventory, analysis, and interpretation of the vegetation. Vegetation factors in turn need to be related to the various biological and social factors governing game distribution and population. A thorough understanding of the relationships between understory vegetation, timber stand structure, and wildlife should enable the forest landowner to achieve the optimum use as determined by policy and personal objectives."--Auth. summ.

Krefting, L. W. (US F&WS, U. Minn., St. Paul 1.) SURVIVAL AND GROWTH OF SOME WILDLIFE COVER PLANTINGS IN MINNESOTA. U. Minn., Minn. For. Notes no. 79. 2 p., 2 photos. Apr. 1959.

Five experimental plantings of conifers were made in ne. Minn. in 1934. Three consisted of 302 wild balsam firs 6-8 ft. tall. Two consisted of 147 wild spruce about 8 ft. tall. One of these was black spruce, one a mixture of black and white spruce. Spacing ranged from 3 x 3 ft. to 4 x 6 ft. All plantings were studied in 1958, 24 years after establishment. Survival of firs in plantings varied from 42% to 85% and av. 63%. Heights of firs ranged from 10 to 33 ft. D.b.h. ranged from 1.4 to 4.8 in. This growth and survival was despite deer browsing on all firs in first 2 winters. Survival of spruce was 68.7% by 1958 despite cutting of many trees in one planting by snowshoe hares. Spruce ranged in height from 18 to 35 ft., in d.b.h. from 2 to 5.1 in. Plantings have been used for cover by deer, ruffed grouse, snowshoe hare, red squirrel, and moose, especially in winter. The plantings broke the wind and contained less snow than nearby areas. The study shows that fairly large wild fir and spruce can be transplanted successfully. Plantings should be at least 1/10 acre in size. Spacing of about 4 x 4 ft. was good in respect to crown closure and natural pruning. Fir seemed better than spruce because deer browsed lower branches and because firs shed their lower branches sooner, which permitted earlier use by deer and grouse.

Spencer, Donald A. (US F&WS, Denver 2, Colo.) PREVENTION OF MAMMAL DAMAGE IN FOREST MANAGEMENT. Proc. Soc. Am. For. Meeting 1958: 183-185. 1958 [1959].

The real need in forest protection is systemics--chemicals that will make the whole seed or whole tree poisonous, or better yet, repellent. Many chemicals are being screened, but the requirements are stiff. That results can be obtained is demonstrated by the success of tetramine. Although so excessively toxic that it is no longer produced, tetramine has shown many virtues in recent tests. When used to treat seeds, it makes the endosperm itself lethal or repellent to mice. It is stable even in wet soils, and trees continue to pick it up from the soil for years in protective amounts. It is not phytotoxic in normal

quantities. Tests with carnivores revealed slight danger of secondary poisoning, for the carnivores sickened and refused poisoned mice in time to avoid a lethal dose. Rodents show no ill-effects from continued low dosages, and tend to cut back on food intake on high dosages. Action is on the brain stem and causes convulsions. Animals are able to excrete at least 1/4 the LD_{50} dose per day. No tolerance is developed. It seems that tetramine can be used in the field without undue risks to beneficial animals, if great care is taken. Search for safer compounds is continuing with aid of chemical producers.

Tackle, David. (Intermtn. For. & Range Exp. Sta., Missoula, Mont.) A FURTHER TEST OF TREE BANDS FOR CONE PROTECTION. J. For. 57(5): 373. May 1959.
How wide must aluminum sheets be to keep red squirrels (Tamiasciurus) from climbing trees and cutting cones? Author previously found that 12-in. sheets were too small and that 18-in. sheets fitted around the trunks worked well. Recent tests show that 14-in. and 16-in. sheets also succeed, so 14-in may be considered the minimum effective width.

Wright, Charles W. (N. J. Div. Game.) WILDLIFE MANAGEMENT ON THE WHARTON TRACT. N. J. Outdoors 9(12): 2-11, 13 photos. June 1959.
The 96,000-acre Wharton Tract in the pine barrens was purchased by the state of N. J. in 1955. Its lakes and streams and its oaks and pines are to be utilized according to an interdepartmental plan that assigns priorities to natural areas, wildlife, forestry, recreation, and historic sites according to the best use of a given tract. Timber may be cut on wildlife land when compatible with wildlife aims. Fire is not to be used on wildlife tracts. Oaks are to be favored on these lands. On sections where forestry has priority, burning may be done and oak and pine may be removed. But efforts are to be made to protect red-cedar and holly, and at least 5 good oak trees of 6-inch d.b.h. or more are to be left on each acre. Also to be saved where possible are oaks of 12-inch or greater d.b.h., 4 den trees per 10 acres, and any tree occupied by wildlife. Oaks will be harvested in cooperation with wildlife men.

STRIPPED LAND & MISCELLANEOUS HABITATS

Hart, George E., and Wm. R. Byrnes. (NE. For. Exp. Sta., Upper Darby, Pa.) PERFORMANCE OF TREES PLANTED ON COAL-STRIPPED LANDS IN THE BITUMINOUS REGION OF PENNSYLVANIA. Pa. State For. Sch. (U. Park, Pa.), Res. Pap. no. 28. 2 p. [1959?]
16 species were planted on various sites a decade or more ago. Most successful species are hybrid poplar, black locust, red oak, Japanese larch, Banks pine, and Scotch pine. Each species should be planted by itself in blocks, or in strips of 5-7 rows. Four shrubs that provide food for wildlife were tested: black chokeberry (Pyrus melanocarpa), silky dogwood (Cornus amomum), hazel nut, and arrowwood (Viburnum). These have reached height of about 4 ft. and are bearing fruit.

CONTROL OF VEGETATION WITH HERBICIDES ETC.

Byrnes, W. R., and R. J. Hutnik. (Pa. State U., U. Park, Pa.) PROGRESS REPORT #5. EFFECTS OF CHEMICAL BRUSH CONTROL UPON GAME FOOD AND COVER. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 342-351. Jan. 1959.

Cook, David B. (N. Y. Cons. Dept., Albany.) COOK'S TRICKLER - HOW TO MAKE AND USE IT. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 352-355. Jan. 1959.
Bill of materials, construction, maintenance, and proper use of a simple, rugged, cheaply made and easily operated tool with which to apply basal spray. When correctly used, it will give nearly complete kill of susceptible hardwoods.

Goodwin, Richard H., and Wm. A. Niering. (Conn. Coll., New London.) THE MANAGEMENT OF THE ROADSIDE BY SELECTIVE HERBICIDE TECHNIQUES. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 530-532. Jan. 1959.

Material is similar to that presented by authors in A ROADSIDE CRISIS: THE USE AND ABUSE OF HERBICIDES, Conn. Coll., Conn. Arboretum Bul. no. 11, which is cited in this issue of WR.

Goodwin, Richard H., and Wm. A. Niering. (Conn. Coll., New London.) A ROADSIDE CRISIS: THE USE AND ABUSE OF HERBICIDES. Conn. Coll. (New London), Conn. Arboretum Bul. no. 11: 1-13. Mar. 1959. 10¢.

Herbicides are valuable in maintenance of roadsides, but common abuse of them causes marring of the landscape and unnecessary loss of desirable vegetation. This bulletin cites examples of abuse and makes specific recommendations for proper use of herbicides along roads. The heart of the system is selective treatment of trees so as to preserve a good cover of brush and broadleaved forbs wherever possible. Techniques are described and necessary exceptions are discussed. Under the recommended procedures, ragweed and other annual weeds have little chance to compete. Also, total results are best and cheapest in the long run.

Leonard, Justin W. (Mich. Dept. Cons.) THE USE OF HERBICIDES IN CONSERVATION. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 19-25. Jan. 1959.

Good, well-rounded discussion of subject, with examples from Mich.

Little, Silas. (US For. Serv., New Lisbon, N. J.) A PROGRESS REPORT ON TESTS OF CONTROLLING JAPANESE HONEYSUCKLE. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 360-366. Jan. 1959.

This vine creates smothering masses in many parts of the eastern U. S. Grazing and burning are not effective controls. Even repeated and expensive herbicidal treatments do not eliminate it. A practical remedy is still much desired. [What we really need is importation of a good enemy or disease of honeysuckle from the Old World.]

PROCEEDINGS THIRTEENTH ANNUAL MEETING NORTH CENTRAL WEED CONTROL CONFERENCE, December 10-12, 1956, Chicago, Illinois. viii + 93 p. [1957.] $2.00, paper, from John D. Furrer, U. Nebraska, Lincoln.

Long abstracts of papers that describe state programs, discuss problems, or report progress in tests of weed control methods and chemicals. Includes the following abstracts of interest to wildlife managers: Vegetation control problems in wildlife habitats, by J. H. Davidson. Vegetation control problems in wildlife habitats - water fowl, by M. D. Pirnie. Vegetation control problems in wildlife habitats - fish, by F. F. Hooper. Vegetative control problems in wildlife habitat as they pertain to upland game, by L. C. Ruch. The control of aquatic weeds in water fowl habitats, by F. C. Bellrose. Herbicides for creating wildlife food patches, by R. Thompson and Cyril Kabat. Chemical seedbed preparation for game food patches, by L. Zorb, L. Ruch, and R. G. Heath. Use of herbicides for improving Ozark wild turkey and deer range, by J. B. Lewis and R. L. Dunkeson. Creating and maintaining openings in wood areas by use of herbicides, by L. C. Ruch. A preliminary report on the experimental use of herbicides in Wisconsin to control and manipulate bog type vegetation for waterfowl, by L. R. Jahn and B. H. Popov. Dichlone as a control for algae and submersed aquatics, by H. D. Tate and G. E. O'Brien. A new approach to the control of certain aquatic vegetation, by B. H. Grigsby, R. H. Hamilton, and J. Smith.

PROCEEDINGS FOURTEENTH ANNUAL MEETING NORTH CENTRAL WEED CONTROL CONFERENCE, December 10-12, 1957, Des Moines, Iowa. viii + 81 p. [1958.] $2.00, paper, from John D. Furrer, U. Nebraska, Lincoln.

Long abstracts of papers delivered at meetings. The following may be of interest to wildlife managers: Right of way brush control of electric utility lines, by A. F. Bolgrien. Results of some experiments in the control of certain aquatic weeds in Missouri farm ponds, by Charles R. Walker. Aquatic weeds in Kentucky and preliminary research with certain herbicides used for their control, by Charles C. Bowers, Jr. Further observations on the use of pelleted herbicides for the control of aquatic weeds, by Buford H. Grigsby.

PROCEEDINGS FIFTEENTH ANNUAL MEETING NORTH CENTRAL WEED CONTROL CONFERENCE, December 3-4, 1958, Cincinnati, Ohio. viii + 146 p. [1959.] $4.00, paper, from John D. Furrer, U. Nebraska, Lincoln.

Long abstracts of papers delivered at meetings. The following entries pertain particularly to wildlife work: Response of certain unicellular green algae to several herbicides, by B. H. Grigsby. Controlling cattail and phragmites with amitrol, by H. H. Dill. Application of granular herbicides for the control of submerged weeds, by B. H. Grigsby and James Smith. The effect of applications of pelleted 2,4-D upon the bottom fauna of Kent Lake, Oakland County, Michigan by Frank F. Hooper.

PROCEEDINGS TWELFTH ANNUAL MEETING OF THE SOUTHERN WEED CONFERENCE, January 21, 22, 23, 1959, Shreveport, Louisiana. ix + 325 p., mimeo. 1959. $3.50, paper, from W. K. Porter, Jr., 1226 Stephens Ave., Baton Rouge, La.

Reports of field or laboratory tests of weed control methods and chemicals. The following papers may be of interest to wildlife managers: Experimental control of giant cutgrass in eastern Texas by Phil D. Goodrum and Charles E. Gray. Effects of pelleted herbicides on aquatic weeds (abstract) by R. E. Wilkinson. Relation between date of application and effectiveness of pelleted herbicides (abstract) by R. E. Wilkinson. A comparison of herbicides on water star-grass grown in the greenhouse (abstract) by R. E. Wilkinson. The control of water-primrose in quiescent waters by W. S. Hardcastle and J. T. Davis. There are also several papers on control of woody plants.

PROCEEDINGS SIXTEENTH WESTERN WEED CONTROL CONFERENCE, Spokane, Washington, March 18-20, 1958. iv + 132 p. 1958? $2.00, paper, from Eugene Heikes, Mont. State Coll., Bozeman.

This volume contains several papers on control of brush and range weeds in various parts of the West. Other groups of papers deal with weeds of crops, or with economics of clearing ditches by herbicides. A paper on control of aquatics is listed separately in this issue of WR.

RESEARCH PROGRESS REPORT, RESEARCH COMMITTEE, WESTERN WEED CONTROL CONFERENCE. vii + 108 p. Mar. 1958. $2.00, paper, from Eugene Heikes, Mont. State Coll., Bozeman.

Two techniques papers are of interest: A simplified logarithmic dilution sprayer, by B. E. Day and R. C. Russell (U. Calif. Citrus Exp. Sta., Riverside.); and Evaluating weed control by means of point transects, by Jack P. Corkins and B. E. Day (see Day's address above). Most of the volume consists of sections on brush control, range weeds, crop weeds, and the like. One section is on aquatic weeds, particularly in relation to irrigation canals. This section contains an over-all summary and good abstracts of individual studies on the following topics: cost of controlling weeds and algae in ditches; control of submersed aquatic weeds in ditches by water plantain and copper sulfate; control of algae in ditches by low concentration slug treatment of copper sulfate; bent grasses as competition to waterline weeds on irrigation channels; control of water sedge along irrigation channels; control of miscellaneous weeds along small irrigation ditchbanks; and ecological studies of salt cedar (Tamarix). Other long abstracts in the volume discuss control of salt cedar.

RESEARCH PROGRESS REPORT, RESEARCH COMMITTEE, WESTERN WEED CONTROL CONFERENCE. vii + 97 p. Mar. 1959. $2.00, paper, from Eugene Heikes, Mont. State Coll., Bozeman.

Like the 1958 volume, this one has sections on control of perennial herbaceous weeds, range weeds, woody plants, annual weeds in crops, physiological studies, etc. Each section consists of long abstracts of individual studies and an over-all section summary. The section on aquatics is, as before, chiefly on plants of irrigation ditches. It contains information on control of: water sedge, miscellaneous weeds, sago pondweed, giant sago pondweed, algae, broad-leaved cattail. The same section discusses: control of pondweeds by water plantain and aromatic solvent, effects of acrolein on aquatics and on cotton and other crops, germination of seed of giant sago pondweed, and germination of seed of broad-leaved cattail.

Smith, Edward Ray. A PRELIMINARY STUDY OF VEGETATION ON NORTH CAROLINA PIEDMONT AND MOUNTAIN POWER TRANSMISSION LINE RIGHTS-OF-WAY. Master of Forestry thesis, N. C. State Coll., Raleigh. viii + 136 p., 6 photos, 24 tables. 1959.

Stiles, W. B., compiler. SUMMARY OF WEED CONTROL ON NATIONAL WILDLIFE REFUGES 1958. US F&WS, Wash. 25, D. C. ii + 59 p. Apr. 1959.
A concise summary of a great variety of trials in many parts of the U. S. Results are given for 49 kinds of weeds, many of them wetland, some upland. For each kind of weed, data are reported on locality, date, size of area treated, chemical, dosage rate, method of application, and results. Results are discussed in a paragraph of text that includes statement of costs.

Trumbo, H. A., and W. E. Chappell. (Va. Poly. Inst., Blacksburg.) TECHNIQUES INVOLVED IN THE USE OF CHEMICALS FOR ESTABLISHING WILDLIFE CLEARINGS. Proc. 13th Ann. Meeting NE. Weed Control Conf.: 337-341. Jan. 1959.
Fenuron and Monuron can be used successfully to establish wildlife clearings. Fenuron game quicker results, perhaps because of the solubility of the carrier used. Both chemicals appear to be very effective, can be transported to inaccessible areas by knapsack, require no equipment, and proper amount can be determined and applied by hand. Application rates as low as 1 gram per stem seemed to give results comparable to those of 5 to 10 grams.

Various authors. [CONTROL OF WOODY PLANTS.] Proc. 13th Ann. Meeting NE. Weed Control Conf.: 200-256. Jan. 1959.
This group of papers on control of woody plants by herbicides includes the following: Late summer spraying of oak-maple brush, by R. J. Hutnik and W. R. Byrnes. A new approach to brush control [use of pelleted fenuron] by P. L. Poulos and W. L. Boyd. Further studies on the use of dormant treatments for brush control, by R. E. Sayre and W. E. Chappell. Further developments in the chemical control of conifers, by J. M. Bennett. Chemical brush control on public watersheds and supply lines, by A. W. Paine. Effect of simazine, six experimental triazine compounds and various other herbicides on native weeds and grasses, by James H. Flanagan. Results of foliar and granular applications to mixed brush in 1957, by W. E. Chappell and R. E. Sayre. The emulsification of herbicides, by J. W. Van Valkenburg and J. A. Kelly. Surveys of brush on pole-line rights of way, by C. J. Waldron. The theory and the practice of successful selective control of brush by chemicals, by Wm. C. Hall and Wm. A. Niering.
Other groups of papers in the volume deal with weeds of crops, roadside maintenance, ragweed, aquatics, and forestry.

MAMMALS--GENERAL

Bovbjerg, Richard V. (U. Iowa, Iowa City.) MAMMALIAN PREDATION OF MUSSELS. Proc. Iowa Acad. Sci. 63: 737-740. 1956. [From Biol. Abst. 33(7). No abstract.]

Landau, B. R., and A. R. Dawe. RESPIRATION IN HIBERNATION. Am. J. Physiol. 194(1): 75-82. July 1958. [From J. Mamm. 40(2).]

Langer-Schierer, H., and H. Langer. (Freien U., Berlin.) ON THE FUNCTION OF THE BROWN FATTY TISSUE OF HIBERNATING MAMMALS. Z. Naturforsch. 12b(8/9): 587-589. 1957. [From Biol. Abst. 33(7).]
In German. The brown fatty tissue of hamster and rat are reconsidered on the basis of experiments of Zirm to have a storage function. His results do not justify the conclusion that brown fatty tissue (the hibernating gland) is an organ of internal secretion, but fit the concept of its function as a storage organ.--Auth. abst.

MAMMALS--FAUNAS AND MANUALS

Anderson, Sydney. (U. Kans., Lawrence.) MAMMALS OF THE GRAND MESA, COLORADO. U. Kans. Publ., Mus. Nat. Hist., 9(16): 405-414, 1 map. May 1959.
Annotated list of 27 species; contains notes on localities, weights, molts, reproduction, subspecific identifications, etc. The fauna is chiefly boreal, for the Mesa is a forested, westward extension of the Rockies and is nearly surrounded by hot, dry areas of much lower altitudes.

Feuer, R. C. (U. Mich., Ann Arbor.) MAMMALS COLLECTED IN THE KARLUK LAKE REGION, KODIAK ISLAND, ALASKA. Murrelet 39(3): 37-39, 2 graphs. Sept.-Dec. 1958.
Measurements and natural history notes for Microtus oeconomus, Mustela erminea, Lutra canadensis, and Myotis lucifugus. Graphs show regression of tail length and weight on body length in M. oeconomus.

Polder, Emmett. (Loras Coll., Dubuque, Iowa.) RECENT LOCALITY RECORDS FOR SOME IOWA MAMMALS. Proc. Iowa Acad. Sci. 65: 559-564. 1958. [From Biol. Abst. 33(5).]
New subspecies added to Iowa fauna since 1953 include Blarina brevicauda carolinensis and Sciurus carolinensis carolinensis. Species showing notable extension of range are Lutra canadensis, Urocyon cinereoargenteus, Marmota monax, Tamias striatus, Tamiasciurus hudsonicus and Lepus townsendii. Lynx rufus, though close to extinction in the state, has been reported from all 4 corners of Iowa in the past 20 years. Urocyon made the greatest extension of range, covering all of the northwest quarter of the state in the past 10 years. --Auth. abst.

Sheppe, Walter A., Jr. (Vassar Coll., Poughkeepsie, N. Y.) NOTES ON THE DISTRIBUTION AND HABITATS OF MAMMALS IN THE PACIFIC NORTHWEST. Murrelet 40 (1): 1-4. Jan.-Apr. 1959.
Observations on locality records, critical habitat factors, and natural history of several mammals in the Cascades of w. Wash. and sw. B. C. Species are: Aplodontia rufa, Ochotona princeps, Marmota flaviventris, Citellus columbianus, Eutamias townsendii, Phenacomys intermedius, Microtus oregoni, M. longicaudus, Zapus princeps, Z. trinotatus, Ursus horribilis, and Oreamnos americanus.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Chew, R. M., B. B. Butterworth, and Richard Grechman. (U. of S. Calif., Los Angeles.) THE EFFECTS OF FIRE ON THE SMALL MAMMAL POPULATIONS OF CHAPARRAL. J. Mamm. 40(2): 253. May 1959.
Transect 1500 x 50 ft. along canyon bottom in Malibu burn area in s. Calif. was inspected several days after fire was out. Carcasses of 28 Neotoma, 9 Sylvilagus, 2 Peromyscus, 1 Microtus, 1 Mus, 1 Didelphis, 1 Odocoileus and 2 passerine birds were counted. Most appeared to have died of asphyxiation. Numbers were high enough to suggest that mortality of small mammals may have been complete.--L. F. Stickel.

Christian, John J., and Cobert D. LeMunyan. (Natl. Naval Med. Center, Bethesda, Md.) ADVERSE EFFECTS OF CROWDING ON LACTATION AND REPRODUCTION OF MICE AND TWO GENERATIONS OF THEIR PROGENY. Endocrinology 63(5): 517-529. 1958. [From long abst. in Biol. Abst. 33(5).]
See WR 92 p. 38.

Graham, Samuel A., and Donald R. Satterlund. (U. Mich., Ann Arbor.) WEATHER, WATER LEVELS, AND LARCH SAWFLY COCOONS. For. Sci. 5(1): 28-36, 1 graph. Mar. 1959.
Includes discussion of effects of small mammals on sawfly numbers. Mentions rodent peak populations in n. Mich. in 1953 and 1957 and states that such peaks occur at intervals of 4-5 years. Species of mice and voles involved are not stated.

Pearson, Paul G. (Rutgers U., New Brunswick, N. J.) SMALL MAMMALS AND OLD FIELD SUCCESSION ON THE PIEDMONT OF NEW JERSEY. Ecology 40(2): 249-255. Apr. 1959.

Peromyscus leucopus was associated with perennial forbs in early seral stages much as P. m. bairdii is where it occurs. P. leucopus also occurred in shrub-tree stands of late seral stages. Pitymys pinetorum occurred in the very early and late stages as did P. leucopus. Microtus pennsylvanicus, Sorex cinereus, and Mus musculus were caught in dense Andropogon grass stands that were found in 7, 11, and 16 year stages, but not in later ones. Relative abundance of total population of small mammals increased from the 7-year stage to the 16-year stage as the field aspect developed, decreased by the 46-year stage, and increased as the forest matured. The species distribution reflected the change from grassland to forest.

Smith, Robert Leo. (W. Va. U., Morgantown.) ABUNDANCE OF SMALL MAMMALS IN CONIFER PLANTATIONS. J. Mamm. 40(2): 253-254. May 1959.

Comparable trappings in pure stands of jack pine and larch where herbaceous cover was plentiful showed more Peromyscus and Blarina than in Scotch pine where ground cover was sparse. These results were in accord with general observations among 60 plantations.--L. F. Stickel.

MAMMALS--PARASITES AND DISEASES

Bell, J. Frederick, Wm. L. Jellison, Cora R. Owen, and Carl L. Larson. (Rocky Mtn. Lab., Hamilton, Mont.) APPLICABILITY OF THE ASCOLI TEST TO EPIZOOTIC TULAREMIA IN WILD RODENTS. J. Wildl. Mgt. 23(2): 238-240. Apr. 1959.

The Ascoli thermoprecipitin test and isolation procedures for P. tularensis were applied to tissues of 89 voles found dead in the field. In about 75% of the instances, results of the two tests were either both positive or both negative. The safety of the former procedure is much greater for investigators. The value of the thermoprecipitin test in the study of tularemia in nature is discussed.--J. F. Bell.

Bouvier, G., H. Burgisser, and P. A. Schneider. LES MALADIES DES RUMINANTS SAUVAGES DE LA SUISSE. Service Vétérinaire Cantonal et Institut Galli-Valerio, Lausanne, Switzerland. 1-132 p., 77 figs. 1958.

In French. A useful report based on study of 51 ibex, 321 chamois, 40 red deer, and 732 roe deer submitted for pathology examination. It is also based on review of literature: 215 references, almost all in German or French, are cited. Treatment is primarily by ailment. Early sections discuss such ills as tooth wear, accidents, malformations, poisoning, and tumors. Later sections take up the specific troubles caused by ectoparasites, nose flies, parasitic worms, protozoans, viruses, bacteria, and fungi. Text for a major disease takes up definition, history, distribution, symptoms, laboratory findings, diagnosis, methods of treatment and prevention. Numerous illustrations depict parasites and disease conditions.

In general, the game stock is healthy; contagious diseases are relatively rare. Deaths from accidents are commoner than deaths from disease. Mortality from accidents amounts to 50% in ibex, 90% in red deer, 25% in chamois, and 47% in roe deer. In the hare, however, accidents kill only 19% and disease takes many more, as reported in another paper. Despite hunters, poachers, accidents, and disease, it is not rare for big game animals to die of old age. Roe deer and chamois 10 years old are not rare and their condition is generally good. Death from old age may come after the age of 15 years, largely because the molars wear out or become irregular and nearly useless, leading to undernourishment.

Ignoffo, Carlo M. (Agr. Exp. Sta., St. Paul 1, Minn.) KEY AND NOTES TO THE ANOPLURA OF MINNESOTA. Am. Midl. Nat. 61(2): 470-479, 84 figs. Apr. 1959.

Illustrated key to adult sucking lice known or expected to occur on mammals in Minn. Is intended for use of non-specialists. Notes are given on hosts of each species.

Vest, E. Dean, and others. A STUDY OF THE ECOLOGY OF INFECTIOUS DISEASES IN THE NATIVE FAUNA OF THE GREAT SALT LAKE DESERT. 1956-1957 Ann. Rep. Resident Director & Staff, Ecol. Res., U. Utah, Dugway. 1-49 p., graphs. Dec. 1957.

Presents useful summaries of many related studies. Tularemia infection in various mammals and ectoparasites was the subject of several projects. Other projects pertained to rearing of wild mammals and ectoparasites, population studies of rodents and ectoparasites, etc. Manuscripts published or submitted during the year are listed.

SHREWS, MOLES, BATS

Anon. BAT BITE CONFIRMED CAUSE OF HUMAN RABIES DEATH. Calif. Vector Views 6(3): 20. Mar.-Apr. 1959.

A woman picked up a bat that was lying on the ground, was bitten on the finger, promptly received full anti-rabies treatment, but died of rabies 67 days after exposure. This occurred in Butte Co., Calif. The bat was Lasionycteris noctivagans. Rabid insectivorous bats have been found in 19 states of the U. S., Canada, and other parts of world. [It seems to be an excellent rule not to touch any bat that seems sick. Any bat that bites you should be tested for rabies.]

Conaway, C. H. (U. Mo., Columbia.) THE REPRODUCTIVE CYCLE OF THE EASTERN MOLE. J. Mamm. 40(2): 180-194, 4 figs. May 1959.

The breeding season of Scalopus is restricted to 3 or 4 spring months. Peak of breeding is in Feb. in central Mo. and in late March at Madison, Wis. Only 1 litter per year is produced. Av. litter size is 3.91; the most frequent number is 4. Females breed when 1 year old. Testes of young Scalopus remain in juvenile condition until late Nov. in Mo. At that time a rapid weight increase begins. Spermatogenesis begins during Dec. and sperm reach the epididymis by end of Dec. Maximum testis weights occur in early Jan. Testes regress to about 1/2 maximum size by time copulation occurs. Regression continues during spring and summer. Sperm production ceases in July and testes remain regressed until recrudescence begins in Nov. Seasonal and anatomical variations are noted when the testis cycle of Wis. Scalopus is compared with that in Mo. Interstitial cells of testis are of maximum size in juveniles during fall. At that time seminiferous tubules and sexual accessories are minimally developed. With onset of spermatogenesis, volume and size of interstitial cells decrease and cells appear vacuolated. When spermatogenesis ceases, interstitial cells again increase in size.--Author.

Crowcroft, Peter, and Jean M. Ingles. (Brit. Mus. Nat. Hist., London S.W.7.) SEASONAL CHANGES IN THE BRAIN-CASE OF THE COMMON SHREW (SOREX ARANEUS L.). Nature 183(4665): 907-908, 1 graph. Mar. 28, 1959.

New and more sensitive instruments made it possible to prove what various workers have claimed: that shrew skulls undergo seasonal shrinkage and growth. "It is clear that mean depth of brain-case decreases significantly between October and January, increasing thereafter until July, and then decreasing again as the end of the life-span approaches." Study of the Am. Sorex vagrans from the extremes of its range might provide a means of assessing the effect of climate on seasonal variation of skulls.

Glass, Bryan P., and Claud M. Ward. (Okla. State U., Stillwater.) BATS OF THE GENUS MYOTIS FROM OKLAHOMA. J. Mamm. 40(2): 194-201. May 1959.

Eight species of Myotis are reported for Okla. Four of them, M. grisescens, M. sodalis, M. velifer incautus, and M. subulatus melanorhinus, were previously known, but have considerable range extension. M. lucifugus lucifugus, M. yumanensis yumanensis, M. keeni septentrionalis, and M. austroriparius gatesi are reported for the first time. Forty-one caves known to harbor bats are listed, together with legal descriptions of locations.--B. P. Glass.

New, John G. (State U. Teachers Coll., Oneonta, N. Y.) CAUSES OF MORTALITY IN SHORT-TAILED SHREWS. J. Mamm. 40(2): 244-245. May 1959.

Observations of shrews caught in wire-mesh traps. Two fed quietly until disturbed, then energetically tried to escape. Two others were trying to escape when first observed. Two were found lying on sides and did not recover. Author suspects shock syndrome.--L. F. Stickel.

New, John G. (State U. Teachers Coll., Oneonta, N. Y.) POPULATION STRUCTURE IN BLARINA AT ITHACA, NEW YORK. J. Mamm. 40(2): 243-244. May 1959.

High numbers of Blarina were trapped in second-growth hardwoods in Oct. 1955 and July 1956. Notes are given on reproductive condition and ratings of tooth wear in different age groups.--L. F. Stickel.

RABBITS AND PIKAS

Adams, Lowell. (Calif. For. & Range Exp. Sta., Susanville.) AN ANALYSIS OF A POPULATION OF SNOWSHOE HARES IN NORTHWESTERN MONTANA. Ecol. Monog. 29(2): 141-170, 12 figs. Apr. 1959.

Hares were studied on Bull Is. in Flathead Lake, Mont., for 18 months. Data are given on trapping and marking methods, censusing by trapping and pellet counts, growth in weight, relation of distribution and abundance to environmental factors, reproduction, sex ratios, age ratios, home range size, travels, use of forms and burrows, food habits, re-ingestion, survival, predation, trap sickness, diseases and parasites. Numbers of hares were estimated by live trapping and results were used to calibrate pellet counts. Numbers of pellets increased with density of cover except that numbers dropped at places of densest cover, where food plants could not grow. Breeding season was Mar.-July. The av. ♀ had 2.9 pregnancies in 1953, and 2.8 in 1954. Av. number of young per litter was 2.6 in 1953 and 3.0 in 1954. Sex ratio was about 1:1 in young and adults. Adults were distinguished from young of year largely by color of feet--gray in young until fall molt. Ratio of adults to young was about 1:1 in Feb. 1954. Home ranges were largest for adult ♂♂ (25 acres) and adult ♀♀ (19 acres) and least for immatures (14 acres). Home ranges overlapped. Movements outside home range occurred only in adult and young ♂♂. Hares relied on immobility or on flight for protection, with flight commoner as animals matured. Survival rate of adults from av. time of birth of young to next Feb. was 0.31 compared with 0.09 for young. Annual probability of survival for adults was 0.22. Crude survival rate from start of 1953 breeding to same time in 1954 was 0.47, almost as low as in Minn. hares at time of crash. Main predator, great horned owl, caused at least 1/3 of all deaths. Chief diseases were trap sickness and ringworm. Trap sickness, apparently a severe hypoglycemic condition, affected many more young than adults. "Amplitude of cycles varying from 1:1,000 to 1:2.5 were reported in several comparable studies of snowshoe hares. Although the amplitude appears to be greater northward over the hare range, the north-south gradient is somewhat obscured by amplitudinal variation within localities."

Allen, Jack. (Ind. Cons. Comm.) ROLLER-COASTER RABBITS. Outdoor Ind. 2(9): 23-24. Mar. 1959.

"Rabbit populations [in Ind.] peaked in 1941, 1946, 1949, and 1956. They hit bottom in 1944, 1947, and 1952. It usually takes 3 years to fall from peak to bottom and 3 or 4 years for complete recovery. Efforts to pin blame on weather, hunters, predators have been in vain. Evidence is mounting that the reason is a breakdown in the rabbit's legendary ability to reproduce, but cause of failure is not known." This short, general article also tells how poorly imported rabbits did in Ind., how costly pen-reared ones have been, and what can be done to improve rabbit habitat. The habitat-management suggestions are not the customary ones. They emphasize spreading rather than piling brush, favoring trailing briars rather than tall briars, using sorghum patches, lopping off pines at height of 2 feet, etc. They also emphasize letting grass and Korean lespedeza grow up through the low briars and low, thin brush piles. These recommendations are based on data of Clayton Bushong, whose article is abstracted in this issue of WR.

Anon. CONTROLLING RABBITS. US F&WS, Branch Predator & Rodent Control, 59 Temple Place, Boston 11, Mass. 4 p., 1 fig. Revised May 1959.
Revised extension leaflet. Gives suggestions for control by live trapping, fences, and a variety of repellents. Revisions are chiefly in section on use of repellents in summer.

Bookhout, Theodore A. (Mich. Dept. Cons., Shingleton.) REINGESTION BY THE SNOWSHOE HARE. J. Mamm. 40(2): 250. May 1959.

Bronson, Franklin H., and Otto W. Tiemeier. (Kans. State Coll., Manhattan.) THE RELATIONSHIP OF PRECIPITATION AND BLACK-TAILED JACK RABBIT POPULATIONS IN KANSAS. Ecology 40(2): 194-198, 3 figs. Apr. 1959.
Study of field data leads the authors to conclude that drought and overgrazing caused increase of jack rabbits, and then caused concentration of these hares on the remaining favorable areas. End of drought and growth of vegetation resulted in dispersion. Observers may confuse concentration and dispersion with actual population fluctuations, unless large areas are considered.

Bushong, Clayton. (Ind. Dept. Cons.) MORE RABBITS--THE EASY WAY. Outdoor Ind. 2(10): 7-11, 5 figs. Apr. 1959.
Some unorthodox ideas on cottontail management arose from author's tabulation of habitats in which rabbits actually occurred throughout Ind. in fall and winter of several years. 1. Long grass sticking up through loose brush is probably the best natural cover we can provide. 2. Weeds are good but sericea lespedeza is far better than anything else tried. Plant sericea in patches or strips. Substitute reed canary grass in wet spots. 3. Tall briars are not much good. The briars that rabbits really like are the low ones, like dewberries, that run over the ground and have grass coming up through them. A s. slope covered with grass and trailing briars will have rabbits. 4. Rabbits like stump piles, but it is wise to keep the piles small and simple enough so you can get the rabbits out. 5. Instead of heaping trash in a gully, spread it over an eroded place and let the grass grow through it and around it. 6. Sorghum patches usually get heavy cottontail use. Sow them thinly and make them any size up to 1/8 acre. 7. Watch for odd spots that can be left--or improved--for rabbit cover. 8. Woodlots can have bunnies even if grazed. Cut and windrow brush and limbs around woods edge and let grass and weeds come up in them. Let cut tree tops lie where they fall--don't pile them. Dense woods can be opened in spots or strips and openings seeded to sericea, if there is no grazing. 9. If you have young pines, when they are 5-6 ft. tall, cut them 12-18 in. from ground and sell tops for Christmas trees. Remaining limbs will let grass grow and will give cover for several years. 10. If you really want to farm a few acres just for rabbits, plant multiflora around it and as scattered clumps in it. Make a few very loose brush piles--3-4 per acre. Plant a 1/8-acre strip of sorghum. Put about 1/4 of the area into sericea strips about 20 ft. wide. Keep rest of rabbit factory in grass. Chop out any tree sprouts.

Dexter, Ralph W. (Kent State U., Kent, Ohio.) ANOTHER RECORD OF COPROPHAGY BY THE COTTONTAIL. J. Mamm. 40(2): 250-251. May 1959.

Dodds, Donald G. (Dept. Mines & Resources, St. John's, Newf.) SNOWSHOE HARE RESEARCH IN NEWFOUNDLAND. Trans. NE. Wildl. Conf., 1: 271-276. 1958 (1959).
For abstract see WR 91 p. 50.

Janes, Donald W. (6155 Locust St., Kansas City, Mo.) HOME RANGE AND MOVEMENTS OF THE EASTERN COTTONTAIL IN KANSAS. U. Kans. Publ., Mus. Nat. Hist., 10(7): 553-572, 4 pl., 3 figs. May 1959.
Cottontails of a 90-acre plot at the U. Kans. Nat. Hist. Reservation were studied for 2 years by trapping, tagging, color marking, sight records, and trailing. Home ranges were estimated by 5 methods. The best method ("Composite") was the one that permitted use of data from all sources. At least 9 "peripheral" records for a rabbit were needed to ascertain size of range. On this basis, av. range was 8.34 acres. Ranges were slightly larger for ♂♂ than ♀♀, and were larger in summer than winter. Ranges increased in size as young matured, but were full size by 1st winter. Ranges overlapped. There was no sign of territorialism. In foraging, rabbits moved 175-325 ft. per day and used 10-20% of

home range. In fleeing predators, rabbits moved 30-1,200 ft. and used 5-70% of range. Some rabbits fled in circles for 3,000 ft. and covered 90% of range. Paths or runways were made only in deep snow or thick vegetation. High and low temperatures led rabbits to seek cover deep in woods or under rocks. Ordinarily, forms in grass or brush were used. Most travel was in breeding season. Most activity was at dawn and dusk. There was more activity on dark nights than moonlit nights. Activity was greatest when air temperature was between 0 and 33°F. and there was no rain. Activity also increased as abundance of food decreased, body weight decreased, and amount of ground covered by snow increased. Thus rabbits used their ranges most intensively in winter when food was scarce. Ranges were used most intensively near woods edges and other areas of good cover. Rabbits ranged through woods and along woods edges, but did not cross open areas that were more than 75 ft. wide. [They certainly cross much larger open areas at the Patuxent Refuge.] One rabbit homed 1,100 ft., 1 homed 1,800 ft., and 1 failed to home 1,700 ft. after showing some interesting attempts at orientation.

This paper states many interesting conclusions, but unfortunately it is a narrative report that lacks quantitative data from which one might judge the conclusions. Also unfortunately, the author does not explain just how the "Composite Method" of range estimation is used, he does not tell how he recognized "peripheral" range records, he uses no statistics, and he gives no figures on the correlation of weather with activity.

Kline, Paul D. (Iowa Cons. Comm.) SHALL WE HAVE MORE COTTONTAILS? Iowa Cons. 18(3): 113, 118-119, 2 photos. Mar. 1959.

Good paper that describes in helpful detail the many things that can be done to improve habitats for cottontails. Both summer and winter needs are considered.

Lechleitner, R. R. (Colo. State U., Fort Collins.) SOME PARASITES AND INFECTIOUS DISEASES IN A BLACK-TAILED JACKRABBIT POPULATION IN THE SACRAMENTO VALLEY, CALIFORNIA. Calif. Fish & Game 45(2): 83-91. Apr. 1959.

Jackrabbits were collected for 18 months from Gray Lodge Waterfowl Mgt. Area, Butte Co., Calif. Parasites found were: Holopsyllus foxi, Haemaphysalis leporis-palustris, Haemodipsus sp., Cuterebra sp., Biogastranema affinis, Cittotaenia pectinata, Raillietina retractilus, Taenia sp., Multiceps sp., and Eimeria spp. Blood samples contained antibodies for Rocky Mtn. spotted fever, Q fever, and western equine encephalitis. Occurrence of brucellosis or tularemia was not demonstrated.

Lord, Rexford D., Jr. (Ill. Nat. Hist. Surv., Urbana.) A METHOD FOR MEASURING MORTALITY OF COTTONTAIL RABBITS IN WINTER. J. Wildl. Mgt. 23(2): 241-243. April 1959.

A method for measuring the winter mortality of cottontail rabbits is described. The method is based on dyeing the rabbits' tails different colors during fall and late winter trapping periods and determining the color ratio by a census drive. The reliability of the method is simultaneously checked by Lincoln Index estimates of the fall and spring populations, based on census drives to determine the ratio of dyed to undyed tails observed. Examples of the method applied to two 100-acre study areas are given.--Author.

McDonough, James J., and Herbert K. Maxfield. (Mass. Div. Game, Westboro.) RESULTS OF COTTONTAIL RABBIT MANAGEMENT IN A POLE STAGE FOREST TYPE IN CENTRAL MASSACHUSETTS. Trans. NE. Wildl. Conf., 1: 258-270. 1958 (1959).

For abstract of this important paper see WR 91 p. 52.

Mykytowycz, R. (C.S.I.R.O., Wildl. Surv. Sec., Canberra, Australia.) EFFECT OF INFECTION WITH MYXOMATOSIS VIRUS ON THE ENDOPARASITES OF RABBITS. Nature 183(4660): 555-6. Feb. 21, 1959.

Mykytowycz, R., E. R. Hesterman, and D. Purchase. (Wildl. Surv. Sec., C.S.I.R.O., Canberra, Australia.) PREDATION ON THE WILD RABBIT BY THE AUSTRALIAN RAVEN. Emu 59(1): 41-43. Mar. 1959.

Corvus coronoides preys heavily on the young of Oryctolagus cuniculus by means of systematic searching on ground. It stores portions of the prey. Rabbits, except for mothers of the prey individuals, exhibit little interest in the attacks. There is no reason to think that raven predation has significant effect on rabbit populations.

RABBITS AND PIKAS--Continued

Rowan, Wm., and Lloyd B. Keith. (Keith: U. Wis., Madison.) MONTHLY WEIGHTS OF SNOWSHOE HARES FROM NORTH-CENTRAL ALBERTA. J. Mamm. 40(2): 221-226, 1 graph. May 1959.

646 Lepus americanus were weighed; data were secured for each month of the year. Mean monthly weights are shown graphically, together with their respective fiducial limits (95% level). Both sexes exhibit similar weight curves. Two prominent peaks occur, 1 in Dec., 1 in June. The only significant difference in weight between sexes was in Nov., when ♀♀ weighed more than ♂♂. It is concluded that weight fluctuations are the result of a number of factors rather than a single dominant agent.--L. B. Keith.

Sumner, Lowell. (Natl. Park Serv., Three Rivers, Calif.) THE BATTLE FOR SANTA BARBARA! Outdoor Calif. 20(2): 4-7, 5 photos. Feb. 1959.

Santa Barbara Island, off the Calif. coast, is now part of the Channel Is. Natl. Monument. The island has a peculiar and interesting flora. Domestic rabbits (Oryctolagus cuniculus = European = San Juan) were released during World War II. The rabbit population soon exploded. A dry period came and rabbits so devastated the island that it looked as if a forest fire had struck. Control efforts began in 1954 and continued with increasing force in part of each following year. Thousands of rabbits were removed by poisons, gases, and guns, but each year there were more to be killed. By 1958 real progress in control was being made. Also, the wettest winter since 1937 aided recovery of vegetation. Unfortunately, however, by then much of the native vegetation was replaced by ice plant. This weed covered 85% of the island to a depth of 12-18 in. so densely rabbits could not get through it. Biologists concluded: 1. Rainfall was main determinant of numbers of rabbits and condition of vegetation. 2. Vegetation of the island could hold up against rabbits only in wet periods. 3. Absolute extermination of rabbits on the island was necessary to restore native plant and animal life.

Tyndale-Biscoe, C. H. (U. of W. Australia, Medlands.) RE-INGESTION IN LEPUS CAPENSIS L. AND OCHOTONA ROYLEI OGILBY. Nature 183(4659): 471-472. Feb. 14, 1959.

Re-ingestion probably is common to all lagomorphs. Paper includes useful list of references on the subject.

RODENTS--MISCELLANEOUS

Dodge, Wendell E. (U. Mass., Amherst.) AN EFFECTIVE POISON AND REPELLENT FOR PORCUPINE CONTROL. J. For. 57(5): 350-352, 2 figs. May 1959.

Many baits and poisons were tested. Best was whole apples into which 75-300 mg. sodium arsenite was placed. Best time for use in NE. was winter, when porcupines were concentrated in rocky dens into which apples could be placed with little danger to other animals. The method was given large-scale test in Vermont in winter of 1957-58. Of 101,000 acres treated, 100% control was achieved on about 24,000 acres and 80-100% control on the rest. Best results were in areas that were rechecked and retreated. Author also tested many candidate repellents. Best was beta nitrostyrene mixed in a 20-25% concentration with 10% Altox 4500 as emulsifier and Geon 145 x 3 latex adhesive. This mixture gave 75-90% protection. It could be applied by painting or spraying and weathered well. It is suitable for protecting wooden articles, but is highly irritating and has not been tested for phytotoxicity.

Fisher, K. C., and Mary E. Needler. SPONTANEOUS ACTIVITY OF THE LEMMING DICROSTONYX GROENLANDICUS RICHARDSONI MERRIAM AS INDICATED IN 24-HOUR RECORDS OF OXYGEN CONSUMPTION. J. Cellular & Comp. Physiol. 50(2): 293-308. Oct. 1957. [From J. Mamm. 40(2).]

Hansen, Richard M. (Colo. St. U., Ft. Collins.) ASPECTS OF COAT COLOR IN YOUNG VARYING LEMMINGS. J. Mamm. 40(2): 205-213, 2 figs. May 1959.

Hooven, Edward. (Ore. For. Lands Res. Center, Corvallis.) DEER MOUSE AND REFORESTATION IN THE TILLAMOOK BURN. Ore. For. Lands Res. Cent. (Corvallis), Res. Note no. 37. 1-31 p., 21 figs. Oct. 1958.

Peromyscus maniculatus rubidus were studied by live trapping 3 days a month for a year in 4 different 10-acre plots that were seeded aerially with Douglas Fir seed in Dec. Tetramine-treated seed was used on 2 plots, untreated seed on the other 2. There was no evidence that either type of seed affected mouse populations. No data are given concerning seedling success. Data concerning Peromyscus include: sex and age ratios, catches each period, travels, persistence of individuals in study areas, and breeding season. Numbers trapped and natural history information are included also for other small-mammal species.--L. F. Stickel.

Ingles, Lloyd G. (Fresno State Coll., Fresno, Calif.) A QUANTITATIVE STUDY OF MOUNTAIN BEAVER ACTIVITY. Am. Midl. Nat. 61(2): 419-423, 1 graph. Apr. 1959.

Many authors have considered Aplodontia rufa to be highly nocturnal. Ingles shows that the animals may be active outside their burrows at any hour of day or night, but that there is 50-60% more activity at night. "At night they are more active and wander farther from their underground runways, which, even during the day, lead them to an abundance of protected feeding places. There are 6 or 7 activity periods that occur with considerable regularity each 24 hours. These activity periods vary in length up to 2 hours and 45 minutes. They average 22 minutes longer at night. The activity periods of a captive animal grouped themselves about four activity peaks; the two periods at night being the largest. There is no explanation for the mountain beaver being more nocturnal than diurnal in summer since an abundance of food is safely available at all times."

Keith, James O., Richard M. Hansen, and A. Lorin Ward. (For. & Range Exp. Sta., Ft. Collins, Colo.) EFFECT OF 2,4-D ON ABUNDANCE AND FOODS OF POCKET GOPHERS. J. Wildl. Mgt. 23(2): 137-145, 2 photos. Apr. 1959.

Spraying of weedy, mountain rangeland in w. Colo. with the herbicide 2,4-D resulted in the following changes 1 year after treatment: populations of pocket gophers (Thomomys talpoides) were reduced 87%; production of perennial forbs was reduced 83%; grass production increased 37%; the diet of pocket gophers changed from 82% forbs to 50% forbs, and from 18% grass to 50% grass. Control areas showed no significant change. Although the reasons for the decline in gopher numbers on sprayed areas are not known, depletion of essential food items and nitrate poisoning are discussed as possible explanations.--J. O. Keith.

Layne, James N. (U. Fla., Gainesville.) GROWTH AND DEVELOPMENT OF THE EASTERN HARVEST MOUSE, REITHRODONTOMYS HUMULIS. Bul. Fla. State Mus. (Gainesville), Biol. Sci. 4(2): 61-82, 5 figs. Apr. 1959. 30¢.

Based on study of captive colony for about 1 year, during which 11 litters were born. Breeding occurred throughout year. Gestation period apparently was 24 days or less. Mean litter size was 2.2. Sex ratio at birth was 1:1. Weaning occurred between weeks 2 and 4. Vulvas opened between weeks 4 and 7. Two ♀♀ became pregnant for 1st time at ages of 11 and 20 weeks. Testes enlarged by weeks 7-8. Growth and development of young are described in detail. Development of behavior is also traced. Comparisons are made with published data for the closely related species, R. megalotis.

McCarley, W. H. (S. F. Austin State Coll., Nacogdoches, Texas.) A STUDY OF THE DYNAMICS OF A POPULATION OF PEROMYSCUS GOSSYPINUS AND P. NUTTALLI SUBJECTED TO THE EFFECTS OF X-IRRADIATION. Am. Midl. Nat. 61(2): 447-469, 4 figs. Apr. 1959.

Reports much information on population fluctuations, reproduction, longevity, dispersal, home ranges, sex ratios, and mutations. From summary: The population dynamics of Peromyscus gossypinus and Peromyscus nuttalli were studied for 37 months on two 13-acre plots in a floodplain forest in e. Texas. Male mice of both species from the experimental population were treated with 500r of x-irradiation, administered to the testes, and released back into the population. There was evidence that irradiation decreased the reproductive rate through a decrease in number of litters or size of litters. The life spans of presumed offspring of irradiated P. gossypinus were significantly shorter than the life

spans of presumed offspring of non-irradiated individuals. The irradiated population also had a significantly larger incidence of a pelage color mutation. In spite of the deleterious effects of x-irradiation on the populations, overall size of the irradiated populations was maintained by an increase in dispersal of immigrant mice (largely subadults) onto the study plot.

Nikitina, N. A. PECULIARITIES OF TERRITORY UTILIZATION BY THE MICE, APODEMUS AGRARIUS PALL. Zool. Zh. 37(9): 1397-1408. 1958. [From J. Mamm. 40(2).] In Russian with English summary.

Orr, Howard D. (St. Olaf Coll., Northfield, Minn.) ACTIVITY OF WHITE-FOOTED MICE IN RELATION TO ENVIRONMENT. J. Mamm. 40(2): 213-221, 3 figs. May 1959.

Activity of ♂ Peromyscus l. noveboracensis in outdoor enclosures was recorded by electrical apparatus. Mice were studied both individually and in groups. Activity rates of individuals showed a relationship to humidity and temperature, but not to barometric pressure; they were affected by the presence of other mice under conditions of latent introduction but not by crowding alone. Changing the position of shelter also increased activity. Increased crowding tended to increase activity toward the outer portions of the area. Activity rhythms were practically the same for individuals as for groups; they varied principally with seasonal changes in length of darkness. Awareness of neighboring individuals apparently exists regardless of direct encounters, such as fighting. It is suggested that slight changes in activity offer a sound means of studying ecology and life history of small mammals.--Author.

Pearson, Oliver P. (U. Calif., Berkeley.) A TRAFFIC SURVEY OF MICROTUS-REITHRODONTOMYS RUNWAYS. J. Mamm. 40(2): 169-180, 5 figs. May 1959.

A single-framing motion picture camera synchronized to an electronic flash unit was used to record the passage of animals along meadow mouse runways and to record temperature, relative humidity, and time at which animals passed. More than 26 species of vertebrates used the runways during 111 weeks of recording. Microtus californicus, Reithrodontomys megalotis, various sparrows, Sylvilagus bachmani, and Sorex ornatus passed most frequently. The average traffic in each runway was 11 passages per day, but occasionally was more than 60 per day. During periods lasting 1 to 2 weeks, from 2 to more than 10 individual meadow mice used the same runway, rarely more than 6 harvest mice. Harvest mice and shrews were strongly nocturnal, meadow mice were active at all hours, and brush rabbits were especially active between 5 and 8 a.m. Because of daily and seasonal differences in the time of above-ground activity, lizards encountered a microclimate that averaged 39°F. warmer and 36% less humid than did shrews using the same runways.--Author.

Spencer, Donald Alexander. (US F&WS, Federal Center, Denver 2, Colo.) PORCUPINE POPULATION FLUCTUATIONS IN PAST CENTURIES REVEALED BY DENDROCHRONOLOGY. Ph.D. thesis, U. Colo. 122 p. 1958. [From abstract in Dissertation Abstracts 19(10).]

Porcupine scars in piñon pine are characteristic and identifiable in increment drill samples as well as in cross-cuts. Samples taken on the 100-sq. mi. e. half of the Mesa Verde in sw. Colo. showed the history of the porcupine in this area. "From about 1835, to the present, there have been four surges in the porcupine population on Mesa Verde with intervening periods of ten to fifteen years of relative scarcity. The population curve is pyramidal in form. Three of the irruptions cover periods approximately twenty years in length, 1835-53, 1867-91, and 1924-45. The fourth, of minor intensity, lasted approximately twelve years, from 1898-1910. The peak in the 1880's was at least equal in intensity to that in the 1930's based on the ratio of scars now present to timber stand survival... The porcupine on Mesa Verde is a major factor in maintaining a relatively young age classification in the forest cover."

Sviridenko, P. A. METHOD OF ESTABLISHING THE NUMBER OF PROGENY IN A BROOD OF RODENTS ACCORDING TO PLACENTAL STAINS. Biulleten Moskovskogo Obshchestva Ispytateley Prirody, Otdel Biologicheskii, 63(2): 49-54. 1958.

In Russian with English summary. Author examined 9 Microtus arvalis, Clethrionomys glareolus, Apodemus agrarius, and Apodemus flavicollis. The period of time within which the stains (scars) disappeared was not the same in these species. Scars faded fastest in M. arvalis, less rapidly in C. glareolus and most slowly in Apodemus. Time of retention of pigment in scars varied between individuals of the same species. Using scars, number of progeny can be ascertained for 2 consecutive litters, and time of birth can be calculated approximately. Only clearly outlined dark or gray scars should be counted to estimate number of young; light and almost resolved scars are not reliable. Placental scars remain fully distinct to naked eye for following periods, counting from birth of litter: 6 weeks in M. arvalis, 8 weeks in C. glareolus, up to 5 months in Apodemus. In sexually adult ??, absence of scars, or presence of light obscure scars, is evidence that these mice have not had litters within those periods of time.--From Eng. summ.

van Wijngaarden, A. INSECTICIDES OR BIOLOGICAL MEASURES IN THE CONTROL OF THE CONTINENTAL VOLE, MICROTUS ARVALIS (PALLAS), IN ORCHARDS. Mededel. Directeur Tuinbouw 20(7): 369-374. 1957. [From Biol. Abst. 33(5).]

In Dutch. Outbreaks of continental voles in the Netherlands occur in special well defined areas, big plains of extensively used pastures. In years of high population density, orchards bordering these areas are severely infested and great damage is done. The 3 methods of control are: Poisoning with zinc phosphide or pyrimidine wheat (for lack of labor this method is difficult to apply). The use of mechanically sprayed insecticides, viz. endrine and toxaphene, which, if carried out on a large scale, will be dangerous for man, game, and cattle. Biological control: in the summer of 1955 it was proved that continental voles are not able to infest regularly mowed and browsed meadows, even when these are surrounded by extensively used and heavily infested ones. Probably it will be possible to find a similar solution for orchards. Further experiments are recommended.--From auth. summ.

RATTUS AND MUS

Anon. ANTICOAGULANT RODENTICIDES FOR CONTROL OF RATS AND MICE. US F&WS, Wildl. Leafl. 402: 1-4, illus. Apr. 1959.

Extension-type leaflet on how to prepare wet and dry baits and how to place and operate bait stations.

SCIURIDS

Bopp, Peter. TOPOGRAPHY OF A COLONIAL TERRITORY OF MARMOTS. Rev. Suisse Zool. 63(2): 255-261. 1956. [From Biol. Abst. 33(6).]

In German. Marmots are hunted in Switzerland for their fat. Sixteen thousand were collected in 2 years. Over-population has been given as the cause of heavy tapeworm infestation, consequent upon protection in game preserves. One colonial territory comprising 2 familial territories, at 2400 m. above sea-level, was carefully studied, their areas respectively 1500 and 2000 m^2. in extent. These studies indicated that the concept of the game preserve is justified, that overcrowding does not occur in nature, and that parasitic infestation is not increased by protection. On the other hand, unfavorable environments, even if harboring no natural enemies, should not be artifically colonized.--From abst. by E. Behre.

Castellano, M., F. Penati, and R. Videsott. (U. Torino, Italy.) CARDIO-RESPIRATORY AND ELECTROCARDIOGRAPHIC OBSERVATIONS IN THE MARMOT DURING HIBERNATION AND DURING AROUSAL. Cuore e Circolazione 41(3): 129-150. 1957. [From Biol. Abst. 33(8).]

In Italian. See abstract in Biol. Abst. 33(8).

Flyger, V. F. (Md. Dept. Res. & Ed., Annapolis.) A COMPARISON OF METHODS FOR ESTIMATING SQUIRREL POPULATIONS. J. Wildl. Mgt. 23(2): 220-223. Apr. 1959.
Populations of Sciurus carolinensis in two 10-acre woodlots were studied over a 3-year period. Population estimates were made using the Schnabel formula, employing either of 2 types of data: trap-recapture data and trap-sight data. The latter gave the most satisfactory results because the method was not subject to bias caused by trap-shy or trap-prone animals. Population estimates based on time-area counts were unsatisfactory.--Author.

Musacchia, X. J., and Rodger D. Hamilton. (St. Louis U., St. Louis, Mo.) NOTES ON HIBERNATION AND AWAKENING IN ARCTIC GROUND SQUIRRELS. J. Mamm. 40(2): 201-204. May 1959.

Panuska, Joseph Allan. EXPERIMENTAL HIBERNATION AND CERTAIN ASPECTS OF THE LIFE HISTORY OF TAMIAS STRIATUS (LINNAEUS). Ph.D. thesis, St. Louis U. 171 p. 1958. [From long abstract in Dissertation Abstracts 19(11).]

Strumwasser, Felix. (U. Calif., Los Angeles.) FACTORS IN THE PATTERN, TIMING AND PREDICTABILITY OF HIBERNATION IN THE SQUIRREL, CITELLUS BEECHEYI. Am. J. Physiol. 196(1): 8-14. 1959. [From Biol. Abst. 33(6).]
See abst. in Biol. Abst. 33(6).

Strumwasser, Felix. (U. Calif., Los Angeles.) THERMOREGULATORY, BRAIN AND BEHAVIORAL MECHANISMS DURING ENTRANCE INTO HIBERNATION IN THE SQUIRREL, CITELLUS BEECHEYI. Am. J. Physiol. 196(1): 15-22. 1959. [From Biol. Abst. 33(6).]
See abst. in Biol. Abst. 33(6).

BEAVER

Knudsen, George J. (Wis. Cons. Dept.) THE CASE FOR THE BEAVER POND. Wis. Cons. Bul. 24(4): 3-6, 2 photos. April 1959.
We hear much about beaver damage and the need for control, and it is all true. But there is another side and it is brought out in this article. Knudsen tells just how beaver ponds alter the environment and how they benefit waterfowl, muskrats, mink, otter, raccoon, deer, bear, and woodcock. The ponds improve trout fishing only while they are new. After that there is pressure to remove them from trout streams. There are, however, hundreds of non-trout streams in Wis., and to determine the pros and cons of beavers on them it is necessary to consider a whole array of factors.

Stevenson, A. B., W. D. Kitts, A. J. Wood, and I. McT. Cowan. (U. of B. C., Vancouver.) THE NORMAL BLOOD CHEMISTRY OF THE BEAVER (CASTOR CANADENSIS). B. BLOOD GLUCOSE, TOTAL PROTEIN, ALBUMIN, GLOBULIN, FIBRINOGEN, NON-PROTEIN NITROGEN, AMINO ACID NITROGEN, CREATINE, CREATININE, CHOLESTEROL, AND VOLATILE FATTY ACIDS. Can. J. Zool. 37(1): 9-14. Feb. 1959.

Williams, Roger M. (Idaho Game Dept.) BEAVER MANAGEMENT IN IDAHO. Idaho Wildl. Rev. 11(5): 6-9, 5 figs. Mar.-Apr. 1959.
Beavers barely hung on in Idaho until given protection in 1897. Damage complaints grew with the population, and hundreds of beavers had to be caught by state men each year. In 1930s, a caretaker-trapper system was set up. Caretakers were allowed to pelt a specified number each year and also had to do live trapping and transplanting to handle damage complaints in their own areas. This worked well enough until recent years, when pelt price dropped, too few beavers were caught, and damage complaints rose. An open season was ordained, starting Oct. 1, 1957. Catch was about 24,000, or about 3 times as great as before. This reduced the number of colonies by 32% to 67% in different regions. It reduced but did not stop damage complaints. Only a few drainages were trapped too hard. Trapping seasons of 1958 and later are to have length of trapping period tailored to individual areas. The only real fear is that falling pelt prices may make it impossible to maintain the desired level of trapping. This would mean an expensive control program for the state.

MUSKRAT AND NUTRIA

Anon. NUTRIA ARE BECOMING CROP ENEMY NUMBER ONE. Texas Game & Fish 17(3): 29. Mar. 1959.
"Reports from southeast Texas indicate heavy damage in the marshland, where nutria have practically taken over thousands of acres of the marshes. They are destroying not only duck food, but crops too, according to the reports. The little animal also has spread over much of the eastern half of the State. Many country clubs with lakes are reporting that nutria have eaten off shrubs around the lake banks and are destroying the foundations of some of the dams. Nutria have encroached on State-owned fish hatcheries are are eating all growth on the levees, thereby weakening them so that water seeps out. Many privately owned small lakes in the south Texas area are operating under special programs to kill off the nutria." [Nearly complete.]

Arata, Andrew A. (U. Fla., Gainesville.) ECOLOGY OF MUSKRATS IN STRIP-MINE PONDS IN SOUTHERN ILLINOIS. J. Wildl. Mgt. 23(2): 177-186, 2 figs. Apr. 1959.
Muskrats were studied in striplands to determine any change in biology of animal and to explore wildlife potential of area. Populations were low, av. 2.8 dens/acre. Approx. 100 rats were harvested per year on 1800 acres. Adults comprised 57% of sample, ♂♂ 57%. Reproduction was low, av. 3.4/litter, 2 litters/year. Study of food habits revealed seasonal variations and preferences. Most experimental plantings of aquatic plants were unsuccessful. Incidental management practices are listed, but extensive management of such areas is not recommended.--Author.

Brooks, David M. (Ind. Cons. Comm.) MUSKRAT DAMAGE / PREVENTION AND CONTROL. Outdoor Ind. 2(11): 11-15, 7 figs. May 1959.
How to construct pond dams to resist muskrat burrowing, how to protect the dam after it is built, and how to trap muskrats by various techniques.

Fyvie, A., W. G. Ross, and N. A. Labzoffsky. (Ont. Dept. Lands & For.) TULAREMIA AMONG MUSKRATS ON WALPOLE ISLAND, LAKE ST. CLAIR, ONTARIO. Can. J. Comp. Med. & Vet. Sci. 23(5): 153-156, 1 map. May 1959.
A severe muskrat die-off in a localized area of the Walpole Island Indian Reserve is reported. P. tularensis was isolated from dead muskrats and from water and mud samples collected in the area. Tularemia was diagnosed at the time in humans on the Reserve. Field and laboratory findings are described.--Auth. summ.

Kebbe, C. E. THE NUTRIA IN OREGON. Ore. State Game Comm. Bul. 14(4): 8. Apr. 1959.
Nutria have existed in the wild in Ore. since the 1930s. Some colonies that are mentioned here died out; others all remained small. No more than 31 nutria per winter have been taken in state. Nevertheless, the thousands of nutria now penned in the state represent a great menace, for many will be released as the nutria-rearing bubble breaks. They could do great damage, as shown by their performance elsewhere.

Olsen, Peter F. (U. Mich., Ann Arbor.) DENTAL PATTERNS AS AGE INDICATORS IN MUSKRATS. J. Wildl. Mgt. 23(2): 228-231, 2 figs. Apr. 1959.
This paper describes a technique by which one can age muskrats taken during early spring, when other methods are unreliable. This technique involves the degree of extrusion beyond the bone line of the anteriormost buccal fluting (re-entrant angle) on the first upper molar. The 3 most frequent dental patterns in a series of 681 skulls from s. Manitoba are described, illustrated, and correlated with age.--Author.

Syroechkovskii, E. E. ALTERATION OF GEOGRAPHICAL APPEARANCE OF THE WATER RESERVOIRS IN TEREK-SULAK PLAIN AS A FACTOR AFFECTING THE DISTRIBUTION AND POPULATION DENSITY OF THE ONDATRA. Zool. Zh. 37(8): 1244-1251. Aug. 1958. [From J. Mamm. 40(2).]

FUR ANIMALS, GENERAL

MacLennan, J. M., translator. TRANSLATIONS OF RUSSIAN GAME REPORTS. VOL. 6. (TRAPPING AND THE FUR INDUSTRY, 1951-55). Can. Wildl. Serv. iv + 158 p., 13 figs. 1959. $1.00, paper, from Queen's Printer, Ottawa, Ont., Can.

Sixth and, for the time being, the last number of a highly commendable series. We trust that the series will be resumed when a successor to Dr. MacLennan can be found. The present volume consists of 6 papers from the Russian annual, "Biology of Furbearers." Papers are: On the theory of population numbers of economic wild animals and forecasting their "crops", by I. D. Kiris, p. 1-53. Method of investigating productivity of trapping areas, by D. N. Daniloff, p. 54-83. Principles of typology and valuation of trapping areas, by D. N. Daniloff, p. 84-133. Sharp fluctuations in numbers of economic animals in Bauntovsk District of the Buryat-Mongol ASSR in 1948, by V. V. Timofeyeff, p. 134-138. Problems of the fur industry, by B. F. Tserevitinoff, p. 139-147. Influence of intensive forest-cutting on the productivity of trapping areas (preliminary report), by B. A. Larin, p. 148-158.

Saville, Winston S. (Mass. Div. Game.) FUR FACTS AND TRAPPING IN MASSACHUSETTS. Mass. Div. Fisheries & Game. ii + 41 p., illus. [1959.]

This booklet has 2 sections. Section 1 is a trappers' manual that reviews natural history of each species of fur animal and tells how to trap the animals. It also tells how to take care of traps and pelts. Section 2 is a diversified research report. The Mass. fur take is tabulated, by species, for years 1952-55, and values per pelt are tabulated for same period. Numbers and characteristics of trappers are listed. The number is dwindling. All Mass. trappers today are part-timers. The av. trapper runs 48 traps for 4.5 weeks a year. Fur buying also is a sideline for many men. About 67% to 86% of muskrat catch comes in 1st 3 weeks of season, so a 1-month season should suffice. Primeness of Nov.-caught muskrat pelts was tabulated for regions of Mass. Priming was earliest on Cape Cod, progressively later westward, contrary to what might have been expected from temperature data. Male muskrats far outnumbered ?? in catch. About 7 young per each adult ♀ muskrat appeared in catch, which suggests juvenile mortality of only about 44%. Counts of muskrat houses did not provide simple index to fall population. In 1952 Mass. had about 1,000 beavers in 138 known colonies. Aerial census method was not very satisfactory. Although desirable, beavers must be kept low in most of Mass. Catch ranged from 63 in 1952 to 191 in 1954 and 175 in 1956. An effort to get beavers to repair abandoned, man-made dams gave promising results. Study of mink fall food habits is reported in detail. Crayfish and field mice were leading foods. State's annual fur harvest was worth about $110,000, 96% of which was from muskrat and mink. Recommended are: continued check on fur harvests; a 1-month fall trapping season for muskrats and no spring season, and with mink and otter season concurrent; separate beaver season in late winter.

BEARS

Black, Hugh C. (Cornell U., Ithaca, N. Y.) SECOND PROGRESS REPORT ON THE BLACK BEAR INVESTIGATION IN NEW YORK STATE. Trans. NE. Wildl. Conf., 1: 208-226. 1958 (1959).

Discusses in detail the techniques of live-trapping bears with steel traps and presents some of the results. The No. 150 steel trap, with teeth removed, proved best--a valuable supplement to culvert trapping. These steel traps did, of course, do some damage to the feet of bears, but seldom did much damage. Experience in handling bears with aid of pentobarbital sodium, ether, and succinylcholine chloride is described. Data are given on ages, sexes, and weights of bears caught. Travels and growth of bears recovered after tagging are reported. Bears released near points of capture were recovered, on average, 3-4 miles away. Transplanted bears were recovered, on average, 27 miles from release points. It was clear that four of the 13 transplanted bears had homed.

Youatt, W. G., and A. W. Erickson. (Mich. Dept. Cons., Lansing.) SOME EFFECTS OF SODIUM PENTOBARBITAL ANESTHESIA ON JUVENILE BLACK BEARS. J. Wildl. Mgt. 23(2): 243-244, 2 figs. Apr. 1959.

Sodium pentobarbital was administered intraperitoneally to 3 ♂ and 1 ♀ juvenile Ursus americanus weighing from 24 to 32 lbs. The dosage was 1 grain per 5 lbs. of body weight. Initial response of animals to anesthesia, as expected, was a gradual depression of pulse, respiration, and temperature. Variation occurred between bears in the period immediately preceding recovery. The respiration rate of bears Nos. 1, 3, and 4 showed a rapid rise; that of bear No. 2 remained stable. In bears Nos. 1 and 4 the temperature rose; in bear No. 2 it remained constant; in bear No. 3 it continued to decline. The pulse of bears Nos. 1, 3, and 4 rose quite rapidly, while that of bear No. 2 declined. Variation of individual reaction probably reflected slight differences in the dosage rate and physiological characteristics of individuals.--W. G. Youatt.

RACCOON, RINGTAIL, COATI

Petrides, George A. (Mich. State U., E. Lansing.) AGE RATIOS IN RACCOONS. J. Mamm. 40(2): 249. May 1959.

"... young raccoons in their first winter definitely can be identified as such where X rays of the distal ends of the radius and ulna disclose the epiphyses to be distinct and not fused with the shafts of those bones. Animals in their second and subsequent winters have epiphyses joined with the diaphyses." --L. F. Stickel.

Stains, Howard J. (S. Ill. U., Carbondale.) A CLUE TO SPRING MOLT IN RACCOONS AS REVEALED IN ANALYSIS OF SCATS. Trans. Ill. Acad. Sci. 50: 257-258. Aug. 1958. [From J. Mamm. 40(2).]

MUSTELIDS

Hamilton, W. J., Jr. (Cornell U., Ithaca, N. Y.) FOODS OF MINK IN NEW YORK. N. Y. Fish & Game J. 6(1): 77-85. Jan. 1959.

"The combined analyses of 1,191 summer, fall and winter samples provide the following percentage frequencies: mammals, 38.3; fish, 33.3; amphibians, 20.5; insects, 17.4; crayfish, 13.4; birds, 5.8; reptiles, 2.7; earthworms, 1.3; molluscs, 1.2; and vegetation, 0.2." Results are reported in detail for fall + winter and for summer.--From auth. abst.

DOGS, WOLVES, FOXES

Korschgen, Leroy J. (Cons. Comm., Columbia, Mo.) FOOD HABITS OF THE RED FOX IN MISSOURI. J. Wildl. Mgt. 23(2): 168-176, 1 map. Apr. 1959.

Principal foods in 1,006 stomachs were: hares and rabbits, 36.8% by volume; mice and rats, 22.0%; poultry, 13.7%; other mammals, 7.7%; carrion, 7.7%; livestock, 5.1%; birds, 3.4%; invertebrates, 0.7%; and plant foods, mostly persimmon fruits, 2.7%. Game constituted 43.7% of the diet. Of this total, 36.4% consisted of cottontails and jack rabbits, 2.8% of furbearers, 2.6% of squirrels, and 1.9% of game birds. It was concluded that the effect of red fox predation upon game was minor during the 5 years of this study.--Author.

Linhart, Samuel B. (N. Y. State Cons. Dept.) SEX RATIOS OF THE RED FOX AND GRAY FOX IN NEW YORK. N. Y. Fish & Game J. 6(1): 116-117. Jan. 1959.

Layne & McKeon [N. Y. Fish & Game J. 3(1)] reported that adult ♂ red and gray foxes outnumbered adult ♀ foxes in N. Y. in the years 1951-3. Such differences are generally ascribed to greater wandering of ♂♂. This explanation may not always hold, for tabular data given here for years 1951-7 suggest that the sex ratio has become much more nearly equal. For red foxes it has changed from 139.9 ♂♂ per 100 ♀♀ to 103.0 per 100. It has changed from 186.1 to 86.7 for gray fox. In red fox pups it has varied with no clear trend between 102.7 and 79.8. No explanation for the change in adult sex ratio is advanced. Attempts to correlate the change with various factors were not fruitful.

Lockie, J. D. (Nature Conservancy, 12 Hope Terrace, Edinburgh, Scot.) THE ESTIMATION OF THE FOOD OF FOXES. J. Wildl. Mgt. 23(2): 224-227. Apr. 1959.

Three methods for assessing the food of foxes from fecal analyses were tested. "Frequency of occurrence" had serious errors, the extent of which depended both on the amount of a given food eaten and probably on the order in which it was eaten. "Estimated bulk" also had considerable errors. The "weight of dry undigested matter" in fecal pellets gave an estimate consistent in its error. Correction factors for the differential digestion of various prey species were calculated. These indicate that estimates of rabbit, rat, and small bird need only slight correction, but estimates of vole and large bird require considerable correction. Relative proportions of 3 common rodents eaten by foxes were estimated fairly accurately by expressing the number of molar teeth recovered for each species as a % of all molar teeth recovered. Amounts eaten by captive foxes during 191 days gave an av. daily intake of 378 gm.--From auth. summ.

CATS

Kuyava, Gary C. (Duluth, Minn.) TWO REPORTS OF MOUNTAIN LION FROM LAKE AND COOK COUNTIES [MINNESOTA]. Flicker 31(1): 6. Mar. 1959.

Swink, F. Nelson, Jr. (Va. Comm. Game.) BOBCATS. Va. Wildl. 20(6): 16-17, 2 photos. June 1959.

Pumas are considered exterminated in Va., but bobcats have increased greatly in the past 20 years, thanks to state and federal forest and park land. In good habitat, there may be 1 bobcat to 3-4 sq. mi. Various trapping records indicate that populations often are higher than suspected. Bobcats frequent rocky forested or brushy lands in w. Va., and thickets around the Dismal Swamp. There are few recent records for other areas, but probably there are some bobcats in all counties w. of the Blue Ridge. Males range in weight from 12 to 30 lbs., ♀♀ from 9 to 20. A 40-lb. ♂ was examined. Staple foods in Va. are cottontail and gray squirrel; deer are sometimes taken, especially as carrion. Intensive control is needed only for individuals that take livestock. Bobcats are seldom hunted in Va. except incidentally to other hunting. Most bobcats in Va. breed in Feb. and Mar. and bear young in April and May. Litter size ranges from 1 to 4, av. 2 or 3. Many kinds of internal and external parasites attack bobcats. Two diseases, distemper and cat enteritis, are usually fatal. The combination of diseases and parasites may be the limiting factor.

BIG GAME, GENERAL

Anderson, Chester C. (Wyo. Game Comm.) THE ELK OF JACKSON HOLE / A REVIEW OF JACKSON HOLE ELK STUDIES. Wyo. Game & Fish Comm., Bul. no. 10: 1-184, illus. 1958 [1959].

A fine bulletin that reflects credit upon the author, who has spent years studying the elk of the Grand Teton region, the illustrator, John Coulter, who has provided many interesting drawings and cartoons as well as unusual maps, and upon the Wyo. Game & Fish Comm., which long supported the work and brought out this report in such impressive style. The bulletin has 19 tables, an index, and cites 78 references. Basically, it is a detailed account of everything that pertains to numbers, travels, and management of a herd that has been a problem for half a century. Chapters are: Early history, Administration, Elk population trends, Winter feeding, Winter distribution, Herd losses, Winter-spring ranges, Seasonal migration, Summer distribution and range, Hunting, Sex ratios, Productivity, and Outlook. The problem arose long ago when elk were shut from their winter range by private lands. Breeding freely on national park and national forest lands, the animals damaged their range and starved in winter. Artificial feeding has been done and as much winter range has been provided as possible. Control by hunting has been stepped up. Still there are too many elk, the range is still deteriorating, and fawn production is down. More and better distributed shooting is needed and so is better distribution of elk. Extent of elk removal should depend on condition of range. It is easier and quicker to build back an elk herd than to restore a range. Better range would cause higher fawn production, so a lower population could afford good hunting.

Banfield, A. W. F. (Natl. Mus. Can., Ottawa, Ont.) THE CANADIAN CARIBOU RESEARCH PROGRAM. Trans. NE. Wildl. Conf., 1: 123. 1958 (1959). [Abstract only.]
Describes the program and its importance. States that paper was to be published in Arctic Circular, 1958.

Buss, Irven O., and J. David Solf. (State Coll. Wash., Pullman.) RECORD OF AN ANTLERED FEMALE ELK. J. Mamm. 40(2): 252. May 1959.

Dodds, Donald G. (Cornell U., Ithaca, N. Y.) FEEDING AND GROWTH OF A CAPTIVE MOOSE CALF. J. Wildl. Mgt. 23(2): 231-232, 1 graph. Apr. 1959.
From 2 to 11 weeks of age, weights were recorded at 7-day intervals. Rate of gain accelerated rapidly at age of 8 weeks. Total gain was 75 lbs., from 31 to 106 lbs. General feeding care is described.--Author.

Flinn, Paul. (Idaho Game Dept.) THE CARIBOU OF NORTHERN IDAHO. Idaho Wildl. Rev. 11(5): 10-11, 2 photos. Mar.-Apr. 1959.
There were hundreds of caribou in n. Idaho as recently as the 1890s. They were staple food and were taken for granted as deer are today. There were also some caribou in nw. Mont. and there still are a few in ne. Wash. Idaho herds have dwindled, but there are herds in the Selkirk range. There are at least 100. They are usually seen in bands of 3-5, but a band of 23 has been seen. Logging and fires probably have caused shrinkage of range in recent decades, but the Selkirks were undisturbed until the last few years. Caribou frequent alpine meadows and swampy, shady lake shores. Summer foods are alpine forbs, ground lichens, and sedges. Winter range is chiefly in subalpine virgin forest at about 4500 ft. Winter foods are beard mosses [arboreal lichens?] and occasional evergreen shrubs. Single young, never twins, are born in June. Few calves are seen--no more than 6 per 100 caribou, and it seems likely that many cows do not calve each year. In all, position of caribou in Idaho is precarious.

Hartkorn, Fred. (Mont. Game Comm.) WHERE WERE THE ELK LAST FALL? Mont. Wildl., Feb. 1959: 4-6, 2 figs. Feb. 1959.
Report on travels of 205 of the 678 elk tagged in 7 winters on the Blackfoot-Clearwater Game Range near Ovando, Mont. Locally caught elk had moved north from trap sites. Usually they were within 5 mi. of trap site, but some had traveled more than 20 mi. Elk imported from Yellowstone Park moved south, as elk in the Park do in spring. Local elk seldom moved across major drainages. They seemed to return to the same wintering areas year after year. Elk trapped and transported to relieve damage to haystacks tended to return to the places where caught; transportation for short distances is not effective in damage control.

Jackson, Hartley H. T. (6913 Ridgewood Ave., Chevy Chase, Md.) THE RETURN OF THE VANISHING MUSK OXEN. Smithsonian Rept. 1957(4327): 381-389, illus. 1958. [From Biol. Abst. 33(5).]
The life history of the musk ox is described. The 34 animals captured in Greenland and shipped to Alaska started a herd which could be studied in captivity. While the young could be fairly readily domesticated, the old became belligerent and susceptible to infections and diseases. Commercial use of the musk ox for wool, meat or milk was not practicable, and it is concluded that raising musk oxen commercially is too great a gamble.--F. M. Foote.

Kittams, Walter H. (Natl. Park Serv., Region 2 Office, Omaha, Nebr.) FUTURE OF THE YELLOWSTONE WAPITI. Naturalist 10(2): 30-39, 9 figs. 1959.
Semitechnical report on biology and management of Yellowstone elk, especially the northern herd. About 26% of the park is elk habitat: grassland, sagebrush, and aspen country. Of this, only a small part is snow-free and available to elk in late winter. Kittams discusses sizes, ranges, and migrations of the various Yellowstone herds, then concentrates on the northern herd and its problems. The small interior herds are in good shape, but the northern herd, like the Jackson Hole herd, is too big. Winter range is seriously deteriorated and eroding. Fall migration range has had willow and aspen almost eliminated. Need of herd reduction was seen long ago and hunter kill outside park has been encouraged and aided. Killing in park by rangers began in 1934. First goal was to reduce

herd to 7,000 and present goal is 5,000. The hope is to give the range--and animals other than elk--a chance to recover. Attempts to herd elk outside park have been costly and unsatisfactory. Now chief reliance is on (1) hunter kill, (2) live trapping for use elsewhere, (3) and killing by rangers with carcasses going to Indians. Herd has varied between 7,000 and 9,000 in recent years and has not been reduced to 5,000. Range is still deteriorating. Better range conditions would bring improved rate of reproduction, better calf survival, and better survival of bulls after rutting season. Tag returns showed that the northern Yellowstone herd had little interchange of members with other herds. Very few ?? tried to defend their young against taggers. Study of reproduction proved that yearling ?? bred but rarely. Two-year-old ?? mostly bred; the pregnancy rate was 85% in ?? of this and older ages. Single births were the rule; twins occurred in only 2 of 869 ??. Fetal sex ratio was nearly 1:1. Rate of herd increase was 20% a year.

Mace, R. U. (Ore. Game Comm.) 1958 BIG GAME HARVEST. Ore. State Game Comm. Bul. 14(4): 3-7, 2 graphs. Apr. 1959.
Detailed tabulation and account of Oregon's kill of deer and elk in 1958. Pronghorn kill also is tabulated. More than 116,000 deer were bagged for hunter success of about 50%. Tried for first time and found successful was use of management units within which specified numbers of antlerless deer could be taken. Elk kill remained high, but increased number of hunters dropped hunter success to 14%.

Moisan, Gaston. (Can. Wildl. Serv., Quebec, P. Q.) THE CARIBOU OF GASPÉ. Trans. NE. Wildl. Conf., 1: 201-207. 1958 (1959).
Woodland caribou now exist in Quebec only in small, scattered herds. South of the St. Lawrence, the only herd is in the Shickshocks Mtns. of the Gaspé Peninsula. Flanks of the mtns. are forested, but the plateau-like tops have tundra-type vegetation. The Gaspé herd, like other herds in Quebec, seems to be increasing slowly after great reduction and long protection. Its range is now reduced to about 400 sq. mi., 90% of which is in Gaspesian Park. The remaining range is either inaccessible or unsuited to exploitation. Caribou are often found in summer on lake shores or in open swamps. In winter they feed on the tundra of mtn. tops until spring, unless driven off by formation of hard ice crust. Regular altitudinal migrations result. The animals summer in small groups, but enter tundra, form herds, and breed in the fall. Aerial census is most feasible in Nov., but is difficult. Aerial and ground counts suggest that the Gaspesian herd has 600-1,000 individuals. There are about 44 ♂♂ per 100 ??. Calves make up 20% of herd. Cows usually bear single calves, rarely twins. Calf production varies from 18-25% of number of cows, which is relatively good. Behavior in breeding season is described. Daily travels on Mt. Albert are regular. Rain, fog, or very strong winds cause caribou to leave tundra and take shelter in forested mountainsides. The caribou are in excellent physical condition and have large antlers. About 30% of ??, however, have no antlers; causes are not known. Shortage of climax forest and winter range are the limiting factors. More effort will have to be made to preserve suitable units of range in the Gaspé.

Teal, John H., Jr. (Inst. N. Agr. Res., Tunturi, Vt.) BIOLOGICAL VIGOR AND THE MUSK OX. Trans. NE. Wildl. Conf., 1: 123. 1958 (1959). [Abstract only].
"A discussion of the concept of 'biological vigor', especially as it applies to the present status of the musk ox. Also, a brief report on musk ox investigations in the fields of taxonomy, morphology, ethology, and domestication for use in a northern agriculture."--Complete.

Trotter, R. H. (Ont. Dept. Lands & For., Sioux Lookout.) AERIAL CENSUS OF MOOSE IN ONTARIO. Trans. NE. Wildl. Conf., 1: 233. 1958 (1959). [Abstract only.]
For informative abstract of 10-p. mimeographed version of this paper, see WR 91 p. 67.

Trueblood, M. S., and George Post. (U. Wyo., Laramie.) VIBRIOSIS AS A FACTOR IN THE REPRODUCTION OF ANTELOPE (ANTILOCAPRA AMERICANA). J. Am. Vet. Med. Assn. 134(12): 562-564. June 15, 1959.
A low conception rate was not a factor in the low fawn production in a herd of antelope [in Wyo.]. Vibriosis was incriminated as a possible cause of the low production. Organisms isolated from 9 antelope from this herd fulfilled all available laboratory and clinical diagnostic tests for Vibrio fetus.--From auth. summ.

Ustinov, V. I. HERD SPECIALIZATION IN DEER BREEDING. Zhivotnovodstvo 1956 (12): 65-68. 1956. [From Biol. Abst. 33(7), from Referat. Zh., Biol., 1957, no. 72076.]
No abstract is given by Biol. Abst.

Yanushko, P. A. POPULATION DYNAMICS OF CERVUS ELAPHUS BRAUNERI (SCHARLEMAGNE). Zool. Zh. 37(8): 1128-1235. Aug. 1958. [From J. Mamm. 40(2).]
In Russian with English summary.

DEER (Odocoileus)

Bartlett, C. O. (Can. Wildl. Serv., Box 180, Sackville, N. B.) STARVATION OF DEER ON NAVY ISLAND. Ont. Dept. Lands & For., Tech. Bul., Wildl. Ser. no. 5. ii + 18 p., 10 figs. Apr. 1955.
Navy Is. is in the Niagara R. 3 mi. above Niagara Falls. Its vegetation consists of hardwood forest and abandoned fields. Deer were not hunted, multiplied without control, reached a density of about 1 deer per 4 acres and suffered a starvation die-off of about 60% in Mar.-Apr. 1954. Before starving to death, deer created a conspicuous browse line and also barked many trees. Study of records of snowfall and temperature suggests that these conditions delayed the die-off and increased its severity. Age composition of the population is compared with that of other herds of varying degrees of overpopulation. Recommendation: Annual removal of surplus deer by hunting.

Buss, Irven O. (State Coll. Wash., Pullman.) ANOTHER ANTLERED FEMALE DEER. J. Mamm. 40(2): 252-253. May 1959.

Doutt, J. Kenneth, and John C. Donaldson. (Carnegie Mus., Pittsburgh, Pa.) AN ANTLERED DOE WITH POSSIBLE MASCULINIZING TUMOR. J. Mamm. 40(2): 230-236, 4 photos. May 1959.
Examination of a doe Odocoileus virginianus with polished antlers showed a tumor histologically resembling virilizing human tumors. In the light of what is known of antler formation in doe deer, tumors of this sort may represent one causative agent.--J. K. Doutt.

Goodrum, Phil D., and Vincent H. Reid. (US F&WS, 1117 Ferguson St., Nacogdoches, Texas.) DEER BROWSING IN THE LONGLEAF PINE BELT. Proc. Soc. Am. For. Meeting 1958: 139-143, 1 graph. 1958 [1959].
Based on enclosure studies in se. U.S. About 78 woody species are available to deer in a given locality. About 17% are highly preferred, 33% are intermediate, and 50% are starvation foods. Of the 1st 2 groups, about 27% of species are common enough to make up the bulk of the diet. Evergreen or semi-evergreen hardwoods and vines are choicest foods. Longleaf pine is not eaten; loblolly and shortleaf pines are browsed only on severely overused range. Condition of a local range may be judged by ascertaining degree of browsing on the 8-10 most preferred foods. When about half of these species are overbrowsed, fawn production drops sharply. Put another way, when utilization of any of the common, most preferred foods approaches 40%, overstocking is imminent and herd reduction is in order. Browse in the South is most nutritious when succulent in spring. It drops in nutritiousness as much as 50% by winter. Hence a highly nutritive food is needed in fall and winter. On natural ranges this need is met by acorns and other mast. Prescribed burning helps deer by stimulating sprouting, increasing forbs, and by raising nutritive level of browse. Deer can exist for years on excessively browsed range, but fawn production approaches zero before the deer look poor. The longleaf pine habitat

will support an av. of about 1 deer to 26 acres and still maintain fawn production. This figure varies from place to place. Deer feed on 150 species of herbs, so food shortage rarely occurs in spring, but it can occur on seriously abused range.--From auth. summ.

Harrington, Fred A., Jr. (Colo. State U., Fort Collins.) FURTHER INCIDENCE OF WHITE-TAILED DEER IN COLORADO. J. Mamm. 40(2): 251-252. May 1959.

Hudson, Paul. (Mont. State U., Missoula.) FETAL RECOVERIES IN MULE DEER. J. Wildl. Mgt. 23(2): 234-235. Apr. 1959.

"Over 87 per cent of the female mule deer collected during the breeding season on the National Bison Range were pregnant, with a fetus-doe ratio of 1.7. Roughly 60 per cent of the does had more than one fetus, while 24 per cent of all fetuses recovered were singletons. Identification of sex by external characters can be made when fetuses have attained the age of 60 days, or 70 mm. in F-R [forehead to rump?] length. The sex ratio of fetuses 70 mm. or over was 100 females to 87 males."--Auth. summ.

Jahn, Laurence R. (Wis. Cons. Dept., Horicon.) HIGHWAY MORTALITY AS AN INDEX OF DEER-POPULATION CHANGE. J. Wildl. Mgt. 23(2): 187-197, 4 figs. Apr. 1959.

Records of 6,585 white-tailed deer killed by motor vehicles on Wis. highways from 1946 through 1955 were examined to determine their potential usefulness as population indices. Comparison of the trend of road-kills with the trend of other population indices indicated that, despite systematic corrections for variations in traffic pressure, these road-kill totals cannot be used as a precise index of annual changes in deer populations. Annual and av. seasonal sex ratios of road-killed fawns agreed with the national av. sex ratio of 51.5% ♂. The 10-year fawn sex ratio suggested that ♂ fawns may be less vulnerable to highway accidents than ♀ fawns. Sex ratios of adults, calculated from annual total road-kills, did not represent the status of the herd. Vulnerability of adults to accidents with motor vehicles varied between months.--L. R. Jahn.

Robertson, Fred R., and Robert G. Wingard. LET'S TALK ABOUT DEER MANAGEMENT. Extension Service, Pa. State U., U. Ed. 9-526. 4 p. June 1959.

Good extension leaflet based largely on material of Deer Mgt. Seminar (see WR 93 p. 55). It takes up: economic facts involved, the conflict of interests, breeding habits, feeding habits, effect of hunting on population, effects of nutrition on growth, and effect of deer on forest reproduction. The leaflet does not pretend to present new material, but it does give a good popular summary of the facts. It does not propagandize; it just presents evidence in low-pressure fashion.

Sears, H. S., and L. B. Browman. (Mont. State U., Missoula.) QUADRUPLETS IN THE MULE DEER. Anat. Rec. 122(3): 335-340. 1955. [From Biol. Abst. 33(7).]

A pregnant deer shot in Jan. on Natl. Bison Range, Moiese, Mont. contained 4 ♂ fetuses. These were correlated with 3 corpora lutea in the right ovary and 1 corpus in the right ovary and 1 corpus in the left ovary. The amniotic sacs were all free and separate from one another, although there was complete fusion between the chorio-allantoic membranes of 3 fetuses. The blood supply between the placentomes and fetuses were essentially independent. Although the 4 fetuses were of the same sex, they represented polyzygotic quadruplets rather than monozygotic quadruplets.

Severinghaus, C. W. (N. Y. Cons. Dept., Albany.) RESULTS OF DEER MANAGEMENT. Trans. NE. Wildl. Conf., 1: 358-364. 1958 (1959).

Severinghaus cites a wide array of facts and figures to compare results of deer management in different sections of N. Y. In some areas, herds have failed to grow for many years despite application of the buck law. The reason is illegal killing of does and fawns. Calculations and field studies have shown that the number of antlerless deer left to rot in the woods may be far in excess of the legal kill. This represents the tendency of many hunters to kill every time they get a chance, or to kill any deer just to prove they can kill deer. Neither laws nor waste mean anything to these men. In addition there are poachers who do use, or intend to use, their illegal kills. Some areas have heavy winter kill (starvation) losses to make matters worse. Experience has shown that much of the trouble is removed when shooting of any deer is legalized

to at least some extent. The waste of illegally killed deer drops sharply. Herds can grow as well under such conditions as they can under the buck law--sometimes better, and certainly more economically.

Taylor, Dale L., and James B. Elder. (Kans. Agr. Exp. Sta., Manhattan.) A PRELIMINARY SURVEY OF DEER IN KANSAS. Trans. Kans. Acad. Sci. 62(1): 67-79, 4 maps. 1959.

Questionnaire was sent to County Agr. Agents and Game Protectors throughout Kans. Most respondents reported that deer were increasing in their areas. Deer were reported from all but 4 counties. Largest numbers were in ne., se., and nw. counties. Fewest were in central, s., and sw. counties. Deer were reported mainly from wooded stream valleys, secondarily from upland woods. Reports of crop damage came from 14 counties. The public was considered favorable toward increased numbers of deer, but there was difference of opinion as to whether farmers would favor an open season. Authors conclude that the herd is likely to be large enough for hunting to be started within 5-10 years, although there may be only about 3,000 to 5,000 deer in state at present. Much preparation is needed before hunting: The state should have 1 or more big-game biologists to study census methods, range condition, crop damage, habitat needs, foods, and many other things on a continuing basis. The state should step up the public information program to avoid being saddled with a buck law and to make possible the installation of a permit hunting system. Permit hunting may always be needed, for Kansas probably will never have enough deer to meet the demand.

MAMMALS--MARINE

Barabash-Nikiforov, I. I. PINNIPEDIA OF THE COMMANDER ISLANDS (Sections on sea-lion and harbour seal). Trudy Vsesoiuznovo N.-I. Instituta Rybnovo Khoziaistva i Okeanografii (VNIRO), vol. 3: 231-236. 1936. Fisheries Research Board of Canada, Translation no. 3, 4 p. summary translation by G. Mares, is available on request from Pacific Biological Station, Nanaimo, B. C.

Deliamure, S. L. TOWARDS THE STUDY OF THE HELMINTH FAUNA OF THE DOLPHIN, TURSIOPS TURSIO FABR. Trudy Gelmintologicheskoi Laboratorii Akad. Nauk SSSR, vol. 2, p. 110-113. 1949. Fisheries Research Board of Canada, Translation no. 134, by Deena Wakhroucheff, 6 p., typescript, available on interlibrary loan from L. Margolis, Pacific Biological Station, Nanaimo, B. C.

Deliamure, S. L. DEPENDENCE OF THE HELMINTH FAUNA OF DOLPHINS OF THE BLACK AND AZOV SEAS ON ECOLOGICO-GEOGRAPHICAL FACTORS. Trudy Gelmintologicheskoi Laboratorii Akad. Nauk SSSR, vol. 6, p. 251-258. 1952. Fisheries Research Board of Canada, Translation no. 131, by Deena Wakhroucheff, 10 p., typescript, available on interlibrary loan from: Pacific Biological Station, Nanaimo, B. C.; Biological Station, St. Andrews, N. B.; Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.; Biological Station, Water Street East, St. John's, Nfld.

Deliamure, S. L. ZOOGEOGRAPHICAL CHARACTERISTICS OF THE HELMINTH FAUNA OF PINNIPEDS AND CETACEANS. Trudy Gelmintologicheskoi Laboratorii Akad. Nauk SSSR, vol. 6, p. 235-250. 1952. Fisheries Research Board of Canada, Translation no. 136, by Deena Wakhroucheff, 19 p., typescript, available on interlibrary loan from: Pacific Biological Station, Nanaimo, B. C.; Biological Station, St. Andrews, N. B.; Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.; Biological Station, Water Street East, St. John's, Nfld.

Dorofeev, S. V. STOCKS OF GREENLAND SEALS AND THEIR UTILIZATION. Rybnoe Khoziaistvo, 1956, no. 12, p. 56-59. Fisheries Research Board of Canada, Translation 113, 6 p., preliminary translation by W. E. Ricker, available on request to Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.

Dorofeev, S., and S. Freimann. ATTEMPT AT A QUANTITATIVE ESTIMATE OF THE STOCKS OF THE WHITE SEA HERDS OF GREENLAND SEALS BY AEROPHOTOGRAPHIC SURVEYS. Trudy Nauchnovo Instituta Rybnovo Khoziaistva 2(4): 1-28. 1928. Fisheries Research Board of Canada, Translation no. 68, 6 p. translation of German summary, typescript, available on interlibrary loan from the Biological Station, St. Andrews, N. B.

Dorofeev, S. V., and S. K. Klumov. ON THE QUESTION OF DETERMINING THE AGE OF THE WHITE WHALE, AND THE COMPOSITION OF ITS STOCKS. Trudy Vsesoiuznovo N.-I. Instituta Rybnovo Khoziaistva i Okeanografii vol. 3: 24-34. 1936. Fisheries Research Board of Canada, Translation no. 69, 4 p. summary translation by O. Mares, typescript, available on interlibrary loan from Pacific Biological Station, Nanaimo, B. C.

Dudok van Heel, W. H. (Zool. Sta., Den Helder, Netherlands.) AUDIO-DIRECTION FINDING IN THE PORPOISE (PHOCAENA PHOCAENA). Nature 183(4667): 1063. Apr. 11, 1959.

Elliot, G. H. POLITICS AND THE ANTARCTIC WHALE. Sea Frontiers (Internatl. Oceanog. Found., Coral Gables, Fla.) 4(3): 171-181, illus. Aug. 1958. [From J. Mamm. 40(2).]

Mansfield, A. W. (Arctic Unit, Fish. Res. Bd. Can., Montreal, Quebec.) RESEARCH ON THE ATLANTIC WALRUS. Trans. NE. Wildl. Conf., 1: 106-107. 1958 (1959). [Abstract only.]

Aging by cement layers of teeth indicates that walruses of n. Hudson Bay are smaller than those of Bering Sea. Those of Foxe Basin are between. The aging is best done on ♂♂, for teeth of ♀♀ are difficult to interpret. Males mature at 7 years. They are probably promiscuous; they appear to be in rut from early winter to late spring, with peak in April-May. Females calve April-June. Gestation period is a bit more than 1 year. Reproductive cycle is biennial, but missed pregnancies in older animals result in production of only 1 calf per 3 years on av. An av. ♀ has only about 3 calves in her lifetime. This is a low rate, but mortality also appears to be low. Walrus stocks studied will increase if kill is kept at present level and good utilization of carcasses is maintained. Hunting is wasteful in some areas; more conservation education of natives is needed.

McLaren, I. A. (Fish. Res. Bd. Canada, Montreal.) THE BIOLOGY OF THE RINGED SEAL (PHOCA HISPIDA SCHREBER) IN THE EASTERN CANADIAN ARCTIC. Bul. Fish. Res. Bd. Canada no. 118. vii + 97 p., illus., maps. 1958. [From Biol. Abst. 33(8) and J. Mamm. 40(2).]

Canine teeth, which deposit incompletely calcified dentine in the spring season of low nutrition, are shown to be reliable indicators of age. Claws are useful for the first 10 years. The seal grows from 65 cm. (2.1 feet) to a final adult length of about 135 cm. (4.4 feet). At least 72 food spp. were identified. Food does not limit the range or abundance of this seal. The basking and fasting season, in June and early July, results in much blubber loss, which is regained by summer feeding. The sex ratio is about 53.5 males to 46.5 females. The male matures at about 7 years, and the 1st ovulation of the female usually occurs in the 7th year. The males are in rut from March to mid-May and the female ovulates during lactation, shortly after parturition. The blastocyst implants after about 3.5 months delay, in early Aug., and the corpus luteum changes its structure and increases in size at this time. The pup is produced in 1 of 2 basic types of birth-lair on the fast ice, generally in early April, and may be attended until the ice breaks up. Coastal configuration and latitude govern the amount of fast ice, its stability, and its snow cover, all of which determine the suitability of an area for pupping. More starvelings and small pups are produced on simple coasts, and the adult population of complex coasts is older and the seals are larger in size. Seals of higher latitudes are also larger. There is an annual, small-scale migration, and a dispersal of young seals from productive complex coasts to simple coasts. Ice conditions govern the distribution and abundance of this seal throughout the eastern Canadian arctic.—From auth. abst.

Montreuil, Paul-L. (Lab. Biol. Marine, Iles-de-la-Madeleine, Quebec.) ACANTHOCEPHALAN PARASITES AS NATURAL GUIDES IN SEAL POPULATION STUDIES. Trans. NE. Wildl. Conf., 1: 69. 1958 (1959). [Abstract only.]

Mozgovoi, A. A. TOWARDS THE STUDY OF ANISAKIDS OF WHALES. Trudy Gelmintologicheskoi Laboratorii Akad. Nauk SSSR, Vol. 2, p. 26-40. 1949. Fisheries Research Board of Canada, Translation no. 133, by Deena Wakhroucheff, 9 p., typescript, available on interlibrary loan from L. Margolis, Pacific Biological Station, Nanaimo, B. C.

Mozgovoi, A. A., and K. M. Ryzhikov. THE QUESTION OF THE ORIGIN OF THE BAIKAL SEAL, IN THE LIGHT OF THE SCIENCE OF HELMINTHOLOGY. Doklady Akad. Nauk SSSR 72(5): 997-999. 1950. Fisheries Research Board of Canada, Translation 82, 7 p. typescript of preliminary translation by W. E. Ricker is available on interlibrary loan from Biological Station, St. Andrews, N. B., and Pacific Biological Station, Nanaimo, B. C.

Nagasaki, F. REPORT OF THE FUR SEAL INVESTIGATION IN 1953, NUMBER 2. Japanese Fisheries Agency. Nov. 1953. Fisheries Research Board of Canada, Translation no. 108, by S. Tabata, 18 p., typescript, available on interlibrary loan from F. Taylor, Pacific Biological Station, Nanaimo, B. C.

Nagasaki, Fukuzo, and Koji Matsumoto. HOMING TENDENCY OF THE BACHELOR SEALS TO THEIR NATIVE RODKERIES. Bul. Tokai Reg. Fish. Res. Lab. 18. 15-19, illus. 1957. [From Biol. Abst. 33(7). No abstract.]

Nikulin, P. G. BIOLOGICAL CHARACTERISTICS OF THE SHORE AGGREGATIONS OF THE WALRUS IN THE CHUKOTSK PENINSULA. Izvestiia Tikhookeanskovo N.-I. Instituta Rybnovo Khoziaistva i Okeanografii, vol. 25, p. 226-228. 1947. Fisheries Research Board of Canada, Translation no. 115, 4 p., preliminary translation by W. E. Ricker, available on request to Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.

Pikharev, G. A. THE FOOD OF THE SEAL PHOCA HISPIDA. Izvestiia Tikhookeanskovo N.-I. Instituta Rybnovo Khoziaistva i Okeanografii, vol. 22, p. 259-261. 1946. Fisheries Research Board of Canada, Translation no. 150, 5 p., typescript, available on interlibrary loan from Pacific Biological Station, Nanaimo, B. C.; and Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.

Purves, P. E., and M. D. Mountford. (Brit. Mus. (Nat. Hist.), London.) EAR PLUG LAMINATIONS IN RELATION TO THE AGE COMPOSITION OF A POPULATION OF FIN WHALES (BALAENOPTERA PHYSALUS). Bul. Brit. Mus. (Nat. Hist.) Zool. 5(6): 123-161, illus. 1959. [From Biol. Abst. 33(8).]

The method of grinding ear plugs of fin whales and counting their laminae is briefly described. Growth of plug is compared with that of skull width and body length [with various charts and tables]. A provisional rate of formation of laminae is assessed and correlated with previously established data about growth and age of fin whales. From the age frequency distribution, based on the ear plug lamination analyses, the apparent natural mortality rate for the "Sanctuary" population is demonstrated.--Auth. synopsis.

Sdobnikov, V. HUNTING GREENLAND SEALS WITH NETS ON THE MURMAN COAST. Trudy Arkticheskovo Instituta 3(2): 63-71. 1933. Fisheries Research Board of Canada, Translation 88, 15 p. typescript is available on interlibrary loan from Biological Station, St. Andrews, N. B.

Sergeant, D. E. (Arctic Unit, Fish. Res. Bd. Canada, Montreal, Quebec.) TECHNIQUES OF AGING ARCTIC AND SUBARCTIC MARINE MAMMALS. Trans. NE. Wildl. Conf., 1: 106. 1958 (1959). [Abstract only.]

"A review is given of a method of age determination applied to seals which uses regular growth-zones, or alternations of type of deposition, in the dentine and in some species the cement of the canine teeth. The writer has applied this method with some success to the homodont teeth of Odontocete whales, in studies of the white whale, Delphinapterus leucas and pilot whale Globicephala melaena. Possible explanations of the growth phenomena seen in the teeth of

different species are discussed. The writer has recently found clear growth-zones in the cement of the incisors of moose, Alces americanus. The age determined from these growth-zones agrees well with that determined using the customary method based on wear of teeth. The new method may prove of wider application amongst game Ungulates and Carnivores."

Sleptsov, M. M. DETERMINATION OF THE AGE OF DELPHINUS DELPHIS L. Biulleten Moskovskovo Obshchestva Ispytatelei Prirody, Otdel Biologicheskii, 49(2): 43-61. 1940. Fisheries Research Board of Canada, Translation no. 46, 19 p., typescript, available on interlibrary loan from Pacific Biological Station, Nanaimo, B. C.; and Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.

Sleptsov, M. M. NEW DATA ON THE REPRODUCTION OF THE FAR-EASTERN PINNIPEDS. Izvestiia Tikhookeanskovo N.-I. Instituta Rybnovo Khoziaistva i Okeanografii, vol. 31, p. 73-77. 1949. Fisheries Research Board of Canada, Translation no. 149, 10 p., typescript, available on interlibrary loan from: Pacific Biological Station, Nanaimo, B. C.; Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.; Natl. Res. Council Library, Translation Section, Ottawa, Ont.

Sleptsov, M. M. BIOLOGY OF WHALES AND THE WHALING FISHERY IN FAR EASTERN SEAS. Food Industries Press, Moscow. 1955. Fisheries Research Board of Canada, Translation 118, translation of CONTENTS and CONCLUSION, by W. E. Ricker, 6 p., typescript, available on interlibrary loan from: Biological Station, St. Andrews, N. B.; Pacific Biological Station, Nanaimo, B. C.; Biological Station, Water Street East, St. John's, Nfld.; Fisheries Res. Bd. Can., Arctic Unit, 505 Pine Ave. West, Montreal, P. Q.

Svihla, Arthur. (U. Wash., Seattle.) NOTES ON THE HAWAIIAN MONK SEAL. J. Mamm. 40(2): 226-229. May 1959.

Field notes from various sources indicate that Monachus schauinslandi is apparently increasing in numbers. Movement of the animals on land and in water, growth, molt, development, habits, and respiration rates are described.--Author.

Tomilin, A. G. (Moscow Inst. Furs & Peltries, USSR.) ADAPTIVE TYPES IN THE ORDER CETACEA (THE PROBLEM OF AN ECOLOGICAL CLASSIFICATION OF CETACEA). Fish. Res. Bd. Canada, Transl. Ser., no. 95. 14 p., processed. 1957. Transl. from Zool. Zh. 33(3): 677-692. 1954.

Another product of the extensive program of translating fisheries and wildlife literature that has been undertaken by the Canadian government.

Wilke, Ford. (US F&WS, Sand Pt. Naval Air Sta., Seattle 15, Wash.) FAT CONTENT OF FUR-SEAL MILK. Murrelet 39(3): 40. Sept.-Dec. 1958.

Fat content of 2 samples av. 46.0%. For comparison, 7% is very high for domestic mammals. The high fat content helps account for young being able to go unfed for 8 days while mothers are at sea. The stomach serves as a milk reservoir and occupies much of the young seal's body cavity.

BIRDS--GENERAL

Channing, C. H. (Box 331, Clear Lake, Wash.) RESULTANT CONFUSION IN USAGE OF TERMS DESCRIBING SPECIES OCCURRENCE. Murrelet 40(1): 11. Jan.-Apr. 1959.

Several examples are given of how futile and misleading it often is to refer to an animal by such terms as "common" or "uncommon". Meanings of these terms vary with individuals, and the terms give future workers little to tie to. Channing recommends reporting actual numbers, as in the following: "John Doe in early May of 1919 found seven of these birds along a three mile stretch of the Sanpoil River south of the Gallery Road Bridge and another three birds on the wooded hill two miles north of Chewelah." He feels that the concrete value of such records justifies the greater length. He does not comment on the New York system of rating abundance (see WR 88 p. 59).

BIRDS--GENERAL--Continued

Hicks, Ellis A. (Iowa State Coll., Ames.) CHECK-LIST AND BIBLIOGRAPHY ON THE OCCURRENCE OF INSECTS IN BIRDS' NESTS. Iowa State Coll. Press, Ames. 1-681 p. [1959]. $8.50, cloth.

A compendium of information that represents an almost incredible amount of work and care. The volume contains an Entomological Check-List where occurrences of insects in birds' nests are listed according to the kinds of insects, and an Ornithological Check-List where the occurrences are listed according to the kinds of birds. Thus innumerable problems of both insect and bird taxonomy had to be met and solved. References used for this purpose are included in the appropriate sections. References to occurrences of insects in nests are cited briefly in the check-lists and given in full in the bibliography at the end of the volume. There also is an index to taxa above species. This volume should prove to be an extremely valuable bibliographic source for research workers.--L. F. Stickel.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Grimshaw, H. M., J. D. Ovington, M. M. Betts, and J. A. Gibb. (Nature Conservancy, Grange-over-Sands, Eng.) THE MINERAL CONTENT OF BIRDS AND INSECTS IN PLANTATIONS OF PINUS SYLVESTRIS L. Oikos 9(1): 26-34, 2 graphs. 1958.

"The contents of sodium, potassium, calcium, magnesium, phosphorus and ash in the blue tits, coal tits, goldcrests and the invertebrate canopy fauna in a plantation of Scots pine are given. The significance of the canopy animals in the nutrient cycle of woodlands is discussed."--Auth. summ. Significant differences were found in chemical composition of the bird species. Particularly, goldcrest was quite different from the tits.

Hindwood, K. A. (Sydney, Australia.) THE NESTING OF BIRDS IN THE NESTS OF SOCIAL INSECTS. Emu 59(1): 1-36, 7 pl. Mar. 1959.

Worthwhile monograph on unusual subject; on world basis.

Howell, Thomas R., and George A. Bartholomew. (U. Calif., Los Angeles.) FURTHER EXPERIMENTS ON TORPIDITY IN THE POOR-WILL. Condor 61(3): 180-185, 3 figs. May-June 1959.

Merkel, F. W. STUDIES OF ARTIFICIAL INFLUENCES ON THE ACTIVITY OF CAPTIVE MIGRATORY BIRDS. Vogelwarte 19: 173-185. 1958. [From notice by E. Eisenmann, Auk 76(2).]

In German. Report of effects on migratory restlessness of administration of thyroxin, insulin, methylthiouracil, ultraviolet light, and desoxycorticosteron-acetate.

Morris, D. (U. Oxford, Eng.) THE FEATHER POSTURES OF BIRDS AND THE PROBLEM OF THE ORIGIN OF SOCIAL SIGNALS. Behaviour 9(1): 75-113, illus. 1956. [From Biol. Abst. 33(8).]

See auth. abst. in Biol. Abst. 33(8).

Proescholdt, Mrs. Carl. (Liscomb, Iowa.) MIGRATION AND THE AUTUMN WEATHER PATTERNS OF 1958. Iowa Bird Life 29(1): 6-7. Mar. 1959.

"By examining the daily weather maps, I was often able to predict major flights. Whenever there were east-west opposing low-and-high pressure areas and a favorable weather pattern of a rising barometer, falling temperature, drop in humidity and northerly winds, I could be almost certain there would be a good flight. This particular situation, as described by Hochbaum (1955:104) involves a high-pressure area, with a clockwise movement of air around it, in the western half of the continent and a low-pressure area, with a counter-clockwise air movement, in the east. This creates winds flowing south down the middle between the two air masses and is favorable to autumn migrants moving en masse. There were five such weather maps noted in the autumn of 1958... In addition to the flights resulting from the weather phenomena connected with the opposing pressure systems already mentioned, good flights almost invariably followed a combination of cold fronts, northerly winds, and a drop in humidity. Hochbaum (1955:104), also mentions a rising barometer as being a controlling factor." Some results are discussed.

Rudd, Clayton G., editor. MYSTERY OF MIGRATION. Naturalist 10(1): 1-48, illus. Spring 1959. $1.50 from Nat. Hist. Soc., 315 Med. Arts Bldg., Minneapolis 2, Minn.

A handsomely illustrated special issue devoted to papers on migration of birds, especially waterfowl, and especially in relation to management. The 11 component papers are popular but authoritative. They range in subject matter from experiments on orientation to the history of waterfowl protection, from the story of refuge management to an esthetic appreciation of the migrating hordes. The papers are: Knowns and unknowns about migration, by Clarence Cottam. Science and migration, by Frank C. Bellrose. Mississippi Flyway waterfowl in Mexico, by George B. Saunders. Return those bands, by Orwin A. Rustad. Migration and waterfowl management, by L. R. Jahn, C. E. Shanks, and R. K. Yancey. Homing, by J. Bernard Gollop. Mississippi Flyway Council studies migration, by Arthur S. Hawkins. Birds across the moon, by Wm. A. Rense. Migration magnificent, by Florence Page Jaques. Whooping crane, by Erwin L. Boeker. Migratory waterfowl regulations, by W. A. Elkins. Reproductions of photographs and paintings add greatly to the issue's appeal.

Sabine, Winifred S. THE WINTER SOCIETY OF THE OREGON JUNCO: INTOLERANCE, DOMINANCE, AND THE PECKING ORDER. Condor 61(2): 110-135, 4 figs. Mar.-Apr. 1959.

Schmidt-Koenig, K. EXPERIMENTELLE EINFLUSSNAHME AUF DIE 24-STUNDEN-PERIODIK BEI BREIFTAUBEN UND DEREN AUSWIRKUNGEN UNTER BESONDERER BERÜCKSICHTIGUNG DES HEIMFINDEMÖGENS. Z. Tierpsych. 15: 301-339. 1958. [From notice by W. C. D., Auk 76(2).]

In German with English summary. "This is a report on an experiment dealing with the problem of bird orientation towards a distant goal regardless of its direction. Results show more accurate orientation among the pigeons with their lofts toward the north than among those having to fly towards the south. This is consistent with directional differences found previously in southeastern U. S. A. as well as in Germany."

Verheyen, R. ON THE MOLT OF THE PRIMARIES. Gerfaut 48(2): 101-114. 1958. [From review by E. Eisenmann, Auk 76(2).]

In French. "Describes, with diagrams, the various methods of primary molt, and the groups, so far as studied, in which each method prevails." Eisenmann's review mentions some of the findings.

von St.-Paul, U. NEW EXPERIMENTAL RESULTS ON DISTANT ORIENTATION OF ANIMALS. Vogelwarte 19: 193-198. 1958. [From notice by E. Eisenmann, Auk 76(2).]

In German. "A review of recent experiments by various workers on distant orientation by animals, with useful literature references."

Wagner, H. O. MIXED FLOCKS IN MEXICO, ESPECIALLY THE BEHAVIOR OF NORTHERN MIGRANTS. Z. Tierpsych. 15: 178-190. 1958. [From notice by W. C. D. in Auk 76(2).]

In German with English summary. Deals with causation of winter flocking in birds that ordinarily do not form flocks. Sedentary species form the cores of the flocks. Biological advantages of such behavior are discussed.

West, George Curtiss. SEASONAL VARIATION IN THE ENERGY BALANCE OF THE TREE SPARROW IN RELATION TO MIGRATION. Ph.D. thesis, U. Ill. 70 p. 1958. [From Dissertation Abstracts 19(10).]

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Carleton, G., with collaboration of P. W. Post and E. J. Whelen. THE BIRDS OF CENTRAL AND PROSPECT PARKS. Proc. Linn. Soc. N. Y. nos. 66-70: 1-60. 1958. [From notice by E. Eisenmann, Auk 76(2).]

"Annotated list of birds of two New York city parks, which have been meccas of bird observers during migration periods for three-quarters of a century. Over 250 forms have been reported from each of these parks, although very few are breeders."

Funderburg, John B., Jr., and Thomas L. Quay. (Quay: N. C. State Coll., Raleigh.) SUMMER MARITIME BIRDS OF SOUTHEASTERN NORTH CAROLINA. J. Elisha Mitchell Sci. Soc. 75(1): 13-18. May 1959.
Annotated list of birds of narrow coastal strip 95 mi. long. Special attention is alloted to status and habitats, and to the marsh and aquatic birds.

Hall, C. E., J. E. Hildebrand, R. T. Binhammer, and O. Hall. THE BIRDS OF GALVESTON ISLAND. Texas J. Sci. 11(1): 93-109. Mar. 1959.
This island is on the Texas coast. The paper notes a few faunal changes of recent years and presents a list in which status of each species is indicated.

Höhn, E. Otto. (U. Alberta, Edmonton.) BIRDS OF THE MOUTH OF THE ANDERSON RIVER AND LIVERPOOL BAY, NORTHWEST TERRITORIES. Can. Field-Nat. 73(2): 93-114, 4 figs. April-June 1959.
Long annotated list. Given special attention is migration of white-fronted goose, snow goose, Ross's goose, and black brant. Other annotations deal mainly with occurrence, identification, and life-history notes.

Knorr, Owen A. (1918 Mariposa, Boulder, Colo.) THE BIRDS OF EL PASO COUNTY, COLORADO. U. Colo. Press, Boulder. 48 p. 1959. $1.00. [From Monthly Checklist of State Publications 50(5).]
See abstract of thesis of same title in WR 91 p. 78.

Macpherson, Andrew H., and Ian A. McLaren. (Can. Wildl. Serv., Ottawa.) NOTES ON THE BIRDS OF SOUTHERN FOXE PENINSULA, BAFFIN ISLAND, NORTHWEST TERRITORIES. Can. Field-Nat. 73(2): 63-81, 1 map. April-June 1959.
Long annotated list, chiefly of waterfowl and other water birds, that gives much information on occurrence, notes on life history, and many data on measurements, coloration of soft parts, and Eskimo names. See, for example, the treatment of Branta canadensis and Somateria mollissima. One local population study is reported.

Paul, W. Adrian B. (Kleena Kleene, B. C.) THE BIRDS OF KLEENA KLEENE, CHILCOTIN DISTRICT, BRITISH COLUMBIA, 1947-1958. Can. Field-Nat. 73(2): 83-93. April-June 1959.
Annotated list that emphasizes local status and occurrence but includes a few life-history notes.

Reilly, E. M., Jr., and K. C. Parkes. PRELIMINARY ANNOTATED CHECKLIST OF NEW YORK STATE BIRDS. N. Y. State Mus. & Sci. Serv., Albany 1, N. Y. 1-42 p., 1 map. Mar. 1959. No price stated.
This carefully prepared and authoritative list of 429 species gives good indication of status of each species in state and indicates subspecies (if any) known to occur in state. Categories of relative abundance (such as "common" and "very rare") are defined on p. 2.

Tomkins, Ivan R. THE BIRDLIFE OF THE SAVANNAH RIVER DELTA / GAVIIFORMES THROUGH CHARADRIIFORMES. Ga. Ornith. Soc., Occ. Publ. no. 4. 1-68 p., 5 figs. 1958. Price not stated. Secretary of Ga. Ornith. Soc. is Ed Collum, 1033 Lucille Ave., S.W., Atlanta.
This attractive booklet begins with a good description of the delta area and changes that have affected it during historial time. The bulk of the work consists of an annotated list of birds of the orders Gaviiformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Anseriformes, Falconiformes, Galliformes, Gruiformes, and Charadriiformes. Sections on other birds of the area are not planned. Annotations pertain to status, abundance, and habitats, and often include observations on habits. The booklet is written in more sprightly fashion than customary. Part of the foreword is classic: "Some habitats have expanded; others have shrunk. The observer, too has expanded in some ways, shrunk in others. Had it been possible to develop clearer objectives in the early years, the results might have been better. But too much foresight begets worries, too much hindsight, regrets. I will have nothing to do with either."

BIRDS--POPULATIONS & FLUCTUATIONS

Lack, David. (Ed. Gray Inst., Oxford U., Eng.) A QUANTITATIVE BREEDING STUDY OF BRITISH TITS. Ardea (Leiden) 46(3/4): 91-124, 2 graphs. 1958.

An important study of avian population dynamics. A sequel to Lack's 1955 paper, "British tits (Parus spp.) in nesting boxes" (see WR 83 p. 43). Annual fluctuations in numbers of breeding pairs were irregular. Those of the same species in different woods were usually correlated. Those of great and blue tits were of similar magnitude in both rich and poor habitats. Mean date of laying varied greatly, owing to variations in temperature, especially in Mar.-Apr. In some years, time of laying varied widely in different woods. Laying began earlier in gardens than in woods, later in Corsican than Scots pine. A small decline in mean clutch-size occurred during the main laying period each year in blue tit, half the years in great tit, not in coal tit. Late clutches of great and blue tits were much smaller than early clutches. But early repeat clutches of coal tit were a bit larger than either first clutches or late clutches. Marked annual differences in mean clutch-size in main laying period were due to (1) a tendency in great and blue tits for clutch-size to be higher when mean date of laying was earlier, and (2) an inverse correlation in all 3 species between clutch-size and population density. Clutch-size varied with type of habitat. Hardly any nestlings of great and blue tits starved in broad-leaved woods, but some starved in gardens and many starved in conifers. The coal tit, although adapted primarily to conifers, raised nearly all its young in broad-leaved woods. Second broods were uncommon in all 3 species.--From auth. summ.

Pfeifer, S., and W. Keil. RESEARCH ON INCREASING THE DENSITY OF HOLE-NESTING AND OPEN-NESTING BIRDS, AND FOOD-HABITS STUDIES ON NESTLINGS OF VARIOUS SONGBIRDS IN AN AREA OF DAMAGE BY THE OAK MOTH (TORTRIX VIRIDANA L.) EAST OF FRANKFURT AM MAIN. Biol. Abhand. 15/16: 1-52. 1958. [From notice by E. Eisenmann, Auk 76 (2).]

In German with English summary. "In a 75-acre test plot of forest near Frankfurt, Germany, by providing nest boxes and other nest facilities the breeding bird population was increased from 158 broods in 1951 to 1026 in 1956. 7976 nestlings of ten passerine species were provided with neck collars to check the food brought to them during an outbreak of the oak moth (Tortrix); a major part of the food consisted of some stage of this insect."

BIRDS--ECONOMICS, CONTROL, MORTALITY

Brown, Robert L. (Mont. Game Comm.) MAGPIE UPS AND DOWNS. Mont. Wildl., Feb. 1959: 17-20, 3 figs. Feb. 1959.

Magpie populations were studied on an area of 6 sq. mi. in Bitterroot Valley, Mont. for 2 years. Both years the population was about 700 before breeding. In 1956, 2300 eggs were laid, 1300 nestlings were produced, and 1200 young fledged. Figures for 1957 were only slightly different. Activities of many sorts of predators, including farm people, cut the population back rather rapidly without any organized control program. Great horned owls were found to take many magpies and are believed to have a significant part in magpie reduction. Bounties on magpies have not been successful and are being abandoned in Mont. Use of live traps is recommended; a successful type of trap is illustrated and its use is described. In sparsely settled areas, animal fat treated with strychnine may be placed where there is minimal danger to other animals.

Fletcher, J. R. STARLING ROOSTS IN YOUNG PLANTATIONS. Quart. J. For. 53 (1): 58-60. 1959. [From Biol. Abst. 33(8).]

Fully stocked tree plantations in the thicket stage, about 20-25 ft. in height, are most favored as starling roosts. It is usually inadvisable to interfere with the birds for such work may be expensive and results only in dispersal to other plantations. When run-off water was polluted near Preston (England), however, several methods were tried. The only successful method was the firing of shrapnel in the incoming flock for 6 continuous evenings plus the use of bird-scaring ropes.--P. B. Dowden.

QUAIL

Dickey, Charley. (R. D. 2, Box 408, Greenwood, S. C.) MANAGEMENT OF THE BOBWHITE QUAIL ON SHOOTING PRESERVES. Modern Game Breeding 29(5): 8-15, 5 photos. May 1959.

Bobwhites are the 2nd most popular game on commercial preserves, especially in the Southeast, and some preserves operate with bobwhites alone. Chukars are easily handled with quail, for their needs are much alike. Both tend to become too tame in captivity and both tend to run rather than to hold for dogs. It is very important to select for strains that will fly well; all too many captive strains have been selected for size, which often goes with sluggishness. Some breeders feel that crosses with Tennessee red quail fly better than other captive strains. A person starting in the business should realize that there is little money to be made in it. He should familiarize himself thoroughly with methods of successful operators. It is essential for him to select his area with great care. Many of the criteria to consider in selecting a location are pointed out by the author.

Dickey, Charley. (R. D. 2, Box 408, Greenwood, S. C.) MANAGEMENT OF THE BOBWHITE QUAIL ON SHOOTINGPRESERVES. PART 2. Modern Game Breeding 29(6): 8-17, 9 figs. June 1959.

Advice for the prospective preserve operator. 3-5 thousand birds are recommended for the first year and 8-10 thousand--the number needed for profit--the 2d year. Heavy expenses continue about 3 years. Dickey discusses pros and cons of whether to raise birds or buy them--and at what ages. Buying precautions are emphasized. The most important thing is to have a plan at the beginning so that money is not wasted on equipment that is inadequate for an expanding operation. Other suggestions include use of incubators and caged layers. Procedures necessary to condition young birds to weather and flight are discussed in detail.--L. F. Stickel.

McNally, J. (Fish. & Game Dept. Victoria, Australia.) A PRELIMINARY INVESTIGATION ON THE FOOD OF THE STUBBLE QUAIL IN VICTORIA. Emu 56(5): 367-400, 16 figs., 2 photos. 1956.

Coturnix pectoralis is very numerous in Victoria, where it is native. It is small for a game bird, av. about 106 g., which is less than 4 oz. The species is widely distributed in the state, occurs on pastures, grass and thistle paddocks, in wheat, oat and barley stubbles, and at times in growing cereal crops. Habitat also includes fringes of swamps. Detailed study of food habits throughout year demonstrated that this stubble quail is a ground-feeding seed eater. Seeds eaten include cultivated cereals, pasture plants, and weeds. The majority are introduced annuals. Green leaf material, including grass and clover leaves, is also important. Some invertebrates are eaten. The fact that introduced annuals are so important in the diet suggests that man's agriculture may have improved habitat for this bird. McNally points out that the diet is similar to that reported by Sumner (1935) for the Calif. quail in the U. S. [It seems quite possible, then, that this bird would compete with native quail if introduced into the U. S.]

Ripley, Thomas H., and Russell A. Cookingham. (SE. For. Exp. Sta., Fed. Bldg., Asheville, N. C.) BLACK LOCUST FOR QUAIL IN SOUTHEASTERN MASSACHUSETTS. Trans. NE. Wildl. Conf., 1: 234-238. 1958 (1959).

Quail were studied on Cape Cod for 3 years. About 65% of over-wintering coveys were closely associated with black locust-tatarian honeysuckle stands and used locust seed as main food. Wild quail that fed on locust seed were at least as heavy as those that fed on grain. The combination of black locust and tatarian honeysuckle is worth serious trial in farm-game programs in the NE.

Scott, M. L., E. R. Holm, and R. E. Reynolds. (Cornell U., Ithaca, N. Y.) A STUDY OF THE PHOSPHORUS REQUIREMENTS OF YOUNG BOBWHITE QUAIL. Poultry Sci. 37(6): 1425-1428. Nov. 1958.

PHEASANTS

Dahlgren, Bob. (S. Dak. Dept. Game.) A SURFEIT OF SPORT. S. Dak. Cons. Digest 26(2): 16-17, 1 graph. June 1959.
Figures are cited to show that about one million cock pheasants are wasted in S. Dak. each year through underharvesting. Longer seasons won't increase the kill enough, desirable as they are in other ways. The only solution is to enlarge the daily bag limit.

Delacour, Jean. PHEASANT BREEDING AND CARE. 3d edition. All-Pets Books, Inc., Fond du Lac, Wis. xiv + 108 p., illus. 1959. $4.00. [From review in Outdoor News Bul. 13(9).]
In this 3d edition the descriptions of pheasant species and groups have been enlarged and brought up to date. Dr. E. L. Jungherr has enlarged and revised the chapter on health and disease control. A chapter on shooting preserves is contributed by Dr. E. L. Kozicky. "This is a concise and informative manual. It should be helpful to all persons who raise pheasants professionally or as a hobby."

Holz, Robert. MODERN PHEASANT RAISING / THE NATURAL HISTORY AND RAISING OF THE PHEASANT AS WELL AS A PLAN FOR PHEASANTRY. Publ. by Verlag Paul Parey, Berlin. Pagination not stated. 1928. Carbon copy of a 67-p. transl. by Paul Affolter under direction of H. M. Wight, U. Mich., is deposited in US Dept. Int. Library.
On the European methods of artificial propagation, intensive land management for pheasants, intensive predator control, and hunting by drives and related techniques. Note that this is not a recent publication.

Scott, M. L., E. R. Holm, and R. E. Reynolds. (Cornell U., Ithaca, N. Y.) THE CALCIUM, PHOSPHORUS AND VITAMIN D REQUIREMENTS OF YOUNG PHEASANTS. Poultry Sci. 37(6): 1419-1425. Nov. 1958.

Trautman, Carl, Robert Dahlgren, and John Seubert. (S. Dak. Dept. Game.) PHEASANT NESTING. S. Dak. Cons. Digest 26(1): 18-21, 2 photos. Mar. 1959.
Study was made in summer of 1958 on a township-size area in Brookings Co., S. Dak. There were about 130 adults per sq. mi., and about 2 hens per cock. On advice of Iowa State Coll. Stat. Lab., sampling was done on eight 5-acre croner plots in each section, or 6.25% of total area. Nesting density and nesting success are tabulated by cover types. About 25% of nests produced birds. Av. hen made 4 nests. There were many practice nests. Serious production was mostly in May-June. After June, many birds went into post-nuptial molt and ceased breeding. Also, mowing began in July. Only 4% of nests in mowed alfalfa hatched. Hatching success was 63% in unmowed alfalfa, 35% in sweet clover cut after July 1. Grain and flax fields were important despite low nest density, for these fields covered 50% of area and produced about 45% of hatch. Many nests in these fields appeared to represent renesting. Placement of nests in given cover types was influenced by cover availability, hen's preference, location of cock's territory, land use, and amount of edge. Some hens nested successfully on nearly bare ground. Hens in general showed little preference for heavy, medium, or sparse cover. Predation tended to be most severe in old established cover such as treeland, wild hay, and sloughs. It was lightest in new cover such as crop fields. Two recommendations can be made to farmers: 1. Use flushing bars. This will not save nests but will halve loss of hens. 2. Refrain from mowing roadsides, field borders, etc., until July 10; this is also recommended to highway crews. On game management areas we can: 1. Defer mowing until July 10. 2. Graze pastures very lightly or convert into hay fields. 3. Favor crop types in following order: sweet clover, alfalfa, grain, flax. 4. Encourage strip cover by use of strip cropping.

Westerskov, Kaj. ON THE SOCIAL BEHAVIOR OF THE PHEASANT, PHASIANUS COLCHICUS. Ornith. Mitt. 10: 84. 1958. [From notice by E. Eisenmann, Auk 76(2).]
In German. "In Europe and North America, where winters are snowy and cold, unisexual groups are the usual winter aggregation. In New Zealand, where autumn and winter are mild, three-quarters of all pheasants during these seasons were observed alone and only one-fifth in unisexual groups, which averaged 2-3 individuals."

CORRECTION: Kokeš, Otakar, and Eduard Knobloch. THE PARTRIDGE / ITS LIFE HISTORY, PROPAGATION AND HUNTING (Koroptev / Jeji Zivot, Chov a Lov). Scientific Text Publishers, Prague. About 250 p., illus. 1947. English translation prepared by Can. Wildl. Serv. and reproduced and distributed by Ont. Dept. Lands & For., 278 p., mimeo, 20 offset pl. 1958. Size 8.5 x 14 x 1 in., spiral binder, paper cover. [Supply exhausted. Copies no longer available.]

Our original entry (WR 94 p. 67) credited this translation only to the Canadian Wildlife Service. It has been brought to our attention, however, that the Ontario Department of Lands & Forests initiated the translation and reproduced and distributed the volume. The small supply was soon exhausted and copies are no longer available for distribution.

Bry, Ed. (N. Dak. Game Dept.) THE CHUKAR'S FIRST STAND. N. Dak. Outdoors 21(12): 10-12, 8 photos. June 1959.

Chukars failed at various places in N. Dak. but they now seem to be establishing themselves in the rough country along the Little Missouri R. about 15 mi. s. of Medora. Many broods were seen in 1958. All upland bird shooting in an area of 11 sq. mi. has been stopped to protect the chukars.

Daniell, Paul M. FLIGHTING THE CHUKAR ON SHOOTING PRESERVES. 1-14 p., mimeo. Publ. by author, P. O. Box 2195, Atlanta 1, Ga. Mar. 1959.

Age of bird to buy, holding pens, flight conditioning, feeding for flight, release methods, creation of suitable food and cover in field, selling chukar shooting to the hunter.

Masson, Vic. (Ore. Game Comm.) THE CHUKAR IN THE SOUTHEAST REGION. Ore. State Game Comm. Bul. 14(6): 3, 6-8, 2 figs. June 1959.

A general article on habits and biology of the chukar, with special reference to distribution in se. Ore. (map). Nearly 66,000 game-farm chukars have been released in Ore. since 1951 and some 21,000 of these were released in the 3 se. counties. They have taken hold well and are widely distributed in suitable habitat. The kill was about 10,319 in 1957 and 91,558 in 1958 (presumably in whole state). Released birds have traveled widely, some up to 50 miles, and have populated areas that were not stocked. Water is believed to be important in summer, so Ore. has installed 20 guzzlers in Lake Co. These guzzlers have aluminum catch aprons and covered fiber glass basins. Units are located 1/2 mile to 1 mile apart in a series. Use of guzzlers by adults and broods has been observed. More units will be installed if the present ones result in larger chukar populations. Chukar hunting is popular with some hunters, not with others. One big advantage is that much of the hunting is on open, public land. Chukars do some damage to grain and potato crops and to haystacks, but such damage occurs only when food or water conditions are exceptionally poor. Furthermore, most chukar range is far from agricultural land.

Newman, Duane E. (Wis. Cons. Dept.) SHARPTAILS: A LAND MANAGEMENT PROBLEM. Wis. Cons. Bul. 24(4): 10-12, 6 photos. Apr. 1959.

Maintenance of sharptailed grouse in Wis. depends on keeping open areas free of brush and trees. This is done by controlled burning, herbicides, discing, mowing, and other means. Food patches are planted; they supply not only seeds, greens, and insects, but serve as favored dancing grounds and dusting sites. At present, 116,406 acres in 20 areas are being so managed in Wis. Only 3 of the areas are owned by the Cons. Dept.; the rest are leased from other agencies. With intensive management, these areas will furnish a limited amount of sharptail shooting. The shooting of 2 or 3 decades ago cannot be expected, for too much land is going back into forest.

Steinhoff, Harold W. (Colo. State U., Ft. Collins.) A RATING SCALE FOR BLUE GROUSE RANGE IN COLORADO. Proc. Soc. Am. For. Meeting 1958: 133-138. 1958 [1959].

"1. Relationship between blue grouse abundance and certain ecologic factors was studied on 101 random townships in areas of woody vegetation in Colorado. 2. Grouse abundance was classified from a questionnaire to professional employees of land use agencies. 3. Ecologic factors were measured from a variety of...maps, from compiled and published data, and from the questionnaires... 4. Data were screened statistically and analyzed by Cole's coefficient of

association. 5. Ecologic factors significantly related to grouse abundance and having a coefficient of association greater than 0.3 were combined into the rating scale given under 'Results.' 6. The blue grouse rating scale was tested against the study townships and found to have a ten percent error in classifying townships as 'grouse range' or 'not grouse range,' with nine percent error in the first category and one percent error in the second."--Auth. summ.

TURKEY

Byrd, Mitchell A. (Coll. Wm. & Mary, Williamsburg, Va.) OBSERVATIONS ON LEUCOCYTOZOON IN PEN-RAISED AND FREE-RANGING WILD TURKEYS. J. Wildl. Mgt. 23(2): 145-156. Apr. 1959.

Initial observations on Cumberland State For. indicated that Leucocytozoon infections were common in free-ranging and pen-raised wild turkeys. Natural transmission took place rapidly April 1-15 to experimental birds in the woods. No bird became infected after May 15. Artificial infections were established by intramuscular injection of macerated Prosimulium hirtipes in saline into uninfected birds. The organism encountered in both natural and artificial infections was Leucocytozoon smithi (Laveran and Lucet, 1905). The period of infectivity was correlated with the activity pattern of the fly (Prosimulium hirtipes) and indicated that this was the only vector transmitting the disease on the area. Peak parasitemia was 90 gametocytes per 5-minute search. Infections reached a much higher peak of 180 gametocytes per 5-minute search in experiments with young White Holland domestic turkey poults. Few symptoms observed in wild turkeys could be attributed to the disease. No pathogenicity for wild turkeys could be attributed directly to it. As it exists in the native and pen-raised wild turkeys on the Cumberland For., Leucocytozoon probably should be considered as an inocuous organism.--Author.

Wilson, H. Lee, and James Lewis. (Mich. Dept. Cons., Allegan.) ESTABLISHMENT AND SPREAD OF THE WILD TURKEY IN SOUTHWESTERN MICHIGAN. J. Wildl. Mgt. 23(2): 210-215, 1 fig. Apr. 1959.

The Mich. Dept. Cons. has successfully re-established the e. wild turkey for its esthetic, educational, and scientific values. In 1954 we released 202 in the Allegan Forest area. The turkeys are now successfully established. During the 5 years after release, the flock survived 1 severe winter and displayed characteristics similar to those of normal wild populations in other states. The rate and pattern of range extension were influenced by land use and drainage systems. Broods increased from 21 in 1955 to 32 in 1957. We located 430 turkeys in our summer census of 1958. As indicated by brood observations, the turkeys are established on 106 sq. mi. Based on all sightings, the turkeys inhabit 233 sq. mi.--H. L. Wilson.

Woodgerd, Wes. (Mont. State U., Missoula.) LONG LIVE THE KING. Mont. Wildl., Feb. 1959: 11-13, 2 photos. Feb. 1959.

In 1955 Mont. released 18 wild turkeys from Wyo. in the Longpines For. in Carter Co. They bred rapidly. Some were trapped for stocking in 8 other areas, but still there were about 1000 in the Longpines area in 1958, when unrestricted turkey hunting was permitted in that area for 3 days. The birds proved wild and wary, as in regularly hunted areas. Some 500 hunters took nearly 100 turkeys, and spent about 50 man-hours per bird. Twenty per cent of the birds bagged were gobblers: their av. dressed weight was 14 lbs. Young birds comprised 70% of bag; they weighed about half as much as gobblers.

DOVES AND PIGEONS

Weller, Milton W. (Iowa State Coll., Ames.) MOURNING DOVE NEST IN CATTAIL. Iowa Bird Life 29(1): 24-25, 2 photos. Mar. 1959.

Includes summary of other unusual nesting sites of mourning doves.

Bellrose, Frank C. (344 E. Adams, Havana, Ill.) LEAD POISONING AS A MORTALITY FACTOR IN WATERFOWL POPULATIONS. Ill. Nat. Hist. Surv. (Urbana) Bul. 27(3): 235-288, 10 figs. May 1959. 50¢.

Primary monograph on subject; takes up many aspects of problem and presents experimental data. It begins by reviewing the numerous and widespread die-offs caused by lead poisoning. Such losses have been greatest in Miss. Flyway and much worse in certain localities than others. Mortality is greatest soon after hunting season, for before a year has passed most of the lead has gone deep into the pond bottom and is unavailable. Mallard is chief victim, but pintail is on w. coast. Some poisoned birds void all shot before death. Number of shot ingested depends on availability of shot and diet of ducks in the area. Availability of shot depends on several factors. Number of shot ingested also varies with size of duck and with species of duck. It does not vary with grit preferences of species. Increase in amount of lead ingested has increased with number of duck hunters, and hence is apt to continue. Of gizzards containing shot, 64.7% contained but 1 pellet and only 7.4% contained more than 6 pellets. Tests proved that lead-poisoned ducks are bagged in higher proportion than are healthy birds. Wild mallards dosed with 1 pellet each are 1.5 times as vulnerable as well birds. Those dosed with 4 pellets are 2.1 times as vulnerable. Lead did not affect behavior until 5 days after ingestion. With 1-pellet doses, sickness lasted about 15 days; heavier doses caused longer illness. Lead poisoning caused weakness and reduced migratory travels of test birds. In wild mallard drakes, 1 pellet of no. 6 size causes increase in mortality rate of about 9%. Mortality rises with dosage and with 6 pellets is about 50%. No good substitute for lead pellets has been found. Iron will work, but iron shot are less effective at maximum ranges. About 1/4 of wild mallards in N. Am. ingest shot in any 1 year. Some 4% of mallards of Miss. Flyway die from ingesting lead. For all N. Am. waterfowl, annual loss from this cause is between 2% and 3%. Other studies indicate that lead does not inhibit reproduction of ducks that survive. As the lead problem will increase, the best possible solution to it should be sought.

Cooch, Frederick Graham. THE BREEDING BIOLOGY AND MANAGEMENT OF THE BLUE GOOSE CHEN CAERULESCENS. Ph.D. thesis, Cornell U. 246 p. 1958. [From long abstract in Dissertation Abstracts 19(9).]

These geese breed in 14 major areas from Baffin Is. to Siberia. Techniques were devised for mass trapping flightless birds and almost 25,000 were banded; 2,867 returns were obtained. Chen hyperborea, the lesser snow goose, is considered a color phase. No behavioral differences are noted, but slight differences in nesting curve selects against white-phase in some seasons. Blues are most abundant at Bowman Bay, Baffin Is., but are spreading rapidly, apparently favored by present conditions. Blue phase and mixed pairs are more successful nesters than white phase. Most mating in e. N. Am. is in May. Nest-initiation span is 10 days or less; breeding is more successful in early seasons. The ♀ builds the nest, incubates, and broods. Males and ♀♀ both defend young and territory. Minimum breeding age is 23 mo., av. is 35 mo. Incubation period is 23 days. Basic clutch size is 4.4. Same nesting sites are used in succeeding years when possible. There is no re-nesting. Subadults and failed breeders molt in July, adults with young in Aug. Flightless period is 24 days. Goslings fledge at 49 days, weigh 80 oz. by 80 days. Populations winter and migrate as discrete entities. Occurrence of various migration patterns, dependent on date of first nesting, are predictable.

Cooch, Graham. (Can. Wildl. Serv., Ottawa, Ont.) A STUDY OF SOME ASPECTS OF THE BREEDING BIOLOGY OF THE NORTHERN EIDER, (SOMATERIA MOLLISSIMA BOREALIS). Trans. NE. Wildl. Conf., 1: 122-123. 1958 (1959). [Abstract only.]

Generosoff, V. T. THE CULTURE OF FOOD AND COVER PLANTS FOR WATERFOWL. All-Union Coop. Assoc. Publ. Office, Leningrad, USSR. 128 p., 48 figs., 17 tables. 1934. Carbon copy of a transl. made by B. Rodzianko under direction of H. M. Wight, U. Mich., 105 p., is deposited in US Dept. Interior Library.

W. L. McAtee published a long (3.3 pages) abstract of this work, with his own comments, in WR 3 p. 16-19. Apparently the Biological Survey had the whole work translated by V. Rimsky-Korsakoff—a most unfortunate duplication of labor.

Goehring, Harry H. (State Coll., St. Cloud, Minn.) WOOD DUCK NEST IN ST. CLOUD, MINNESOTA. Flicker 31(1): 2-3. Mar. 1959.

Wood duck nested in hollow tree in busy, noisy, city park and brought off brood of 9 successfully despite much molestation by birders and photographers. The park was 4 city blocks from Miss. R.

Grayson, Janet, and Wm. Grayson. (Blue Ridge Farm, Upperville, Va.) RAISING WOOD DUCKS IN CAPTIVITY. Atlantic Nat. 14(2): 86-96, 8 photos. Apr.-June 1959.

This account of the trials and tribulations the authors underwent in learning how to rear woodducks for release has information that should be of interest to others who wish to rear these birds. By now the Graysons have production of nearly wild birds well underway; in the seasons 1956-58 they released about 125 ducks.

Hanson, W. C., and R. L. Browning. (Gen. Elect. Co., Richland, Wash.) NESTING STUDIES OF CANADA GEESE ON THE HANFORD RESERVATION, 1953-56. J. Wildl. Mgt. 23(2): 129-137, 4 figs. Apr. 1959.

Population density, nesting habits, and various aspects of productivity of Branta canadensis moffitti nesting on the Hanford Reservation in se. Wash. were studied. Complete histories were made on 1,032 nests. Selection of cover type was apparently incidental to other factors, such as availability and visibility from the nest. 71% of nests hatched, 13% were destroyed by predators, 11% were deserted, and 3% were flooded. Hatchability of 3,947 eggs in 732 successful nests av. 92%, 6% contained dead embryos, and 2% were infertile. Av. clutch sizes were 5.3 in 1953 and 1955, and 5.5 in 1954 and 1956. Peak of hatching usually was near last week of April. The breeding population of approximately 300 territorial pairs produced about 810 to 980 young per season. No adverse effect on the adult geese, their eggs, or young by Hanford reactor operations was noted.--Authors.

Holm, Earl R., and Robert V. Bauer. (N. Y. Cons. Dept.) POTENTIALITIES OF CERTAIN SPECIES OF WATERFOWL FOR MASS PRODUCTION. N. Y. Fish & Game J. 6(1): 1-45, 16 figs. Jan. 1959.

A long paper on techniques of artificial production of waterfowl for restocking. It is based on much successful work in N. Y. Investigation emphasized pintail and redhead, but included canvasback, gadwall, shoveller, and blue-winged teal. Among aspects studied were breeding, incubation, brooding, rearing, maintenance in winter, and nutrition. Various types of artificial nest sites were provided; of these, wooden boxes set on posts over the water were best accepted; they were used by both divers and dabblers. Although the species are monogamous, polygamous matings proved desirable for captive flocks. Owing to hybridization, it was best to pen the species separately. Pintails, gadwalls, redheads, and canvasbacks produced substantial numbers of eggs in captivity. Artificial incubation methods that were good for mallards were good for the other species except redheads. Even redhead hatches were satisfactory when eggs were turned a full 180°. Brooding and rearing went well with techniques ordinarily used for mallards. A new type duck brooder house is described. All the species studied overwintered well without artificial shelter at temperatures down to -30° when open water was maintained in the pond. The paper reports many details of a multitude of successful practices.

Kozlik, Frank M., A. W. Miller, and Warren C. Rienecker. (Calif. Dept. Game.) COLOR-MARKING WHITE GEESE FOR DETERMINING MIGRATION ROUTES. Calif. Fish & Game 45(2): 69-82, 2 maps. Apr. 1959.

Lesser snow geese and Ross' geese were colored by dipping wings and tails in alcoholic dye solutions of Rhodamine B, malachite green or picric acid. When snow geese left Tulelake, Calif., in spring, some moved up the coast to Alaska; others went through Alberta to Can. Arctic. Ross' geese marked at Tulelake in fall wintered throughout the Central Valley; none was reported from Imperial Valley. Color-marking makes it possible to get non-hunting and off-season reports, but it does require a good reporting system. Such a system was easily organized through the Pacific Flyway Tech. Comm.--From auth. summ.

Lemieux, Louis. (Can. Wildl. Serv., Quebec, P. Q.) THE BREEDING BIOLOGY OF THE GREATER SNOW GOOSE (CHEN HYPERBOREA ATLANTICA) ON BYLOT ISLAND. Trans. NE. Wildl. Conf., 1: 122. 1958 (1959). [Abstract only.]

Lemieux, Louis. (Can. Wildl. Serv., Quebec, P. Q.) THE BREEDING BIOLOGY OF THE GREATER SNOW GOOSE ON BYLOT ISLAND, NORTHWEST TERRITORIES. Can. Field-Nat. 73(2): 117-128, 1 fig. April-June 1959.

Based on study May 27 to Aug. 29, 1957. Geese nested mainly at sw. corner of Bylot, where land is relatively flat and marshy and protected from n. by mtns. First geese arrived June 2. About 15,000 nested in colonies on slopes of ravines or on sheltered plateaus. Two colonies were studied closely and data were gathered on laying, clutch size, incubation, and hatching. Foods, feeding, behavior, and molt were also studied. Young began to fly about Aug. 20, about 6 weeks after hatching. Geese banded totaled 779; of these, 47 were recovered at Cap Tourmente, P. Q. Food was plentiful on the breeding grounds and no factor appeared to limit increase of greater snow geese on Bylot.--From auth. summ.

Lemieux, Louis, and Gaston Moisan. (Can. Wildl. Serv., Quebec, P. Q.) THE MIGRATION, MORTALITY RATE AND RECOVERY RATE OF THE QUEBEC BLACK DUCK. Trans. NE. Wildl. Conf., 1: 124-148, 10 figs., 9 tables. 1958 (1959).

Presents analysis of data from 5,178 black ducks banded at 4 stations in Quebec. Section 1 of the paper describes migration routes and dates from the 4 stations. Some migrate via Atlantic coastal marshes, others via Hudson and Susquehanna valleys. Migration is in a slow, continuous flow. Section 2 compares mortality rates. Lower mortality of one population is attributed to greater dispersal before hunting. Section 3 takes up seasonal recovery rates, and reasons for differences in them.

Lumsden, H. G. (Ont. Dept. Lands & For., Maple.) THE STATUS OF WATERFOWL IN THE CAPE HENRIETTA MARIA REGION OF ONTARIO. Trans. NE. Wildl. Conf., 1: 156-164. 1958 (1959).

Chiefly on snow geese, but contains information on other waterfowl. Locations of breeding concentration of snow geese are pointed out and breeding habitat is described. Oddly enough, the geese have overbrowsed certain parts of the range in the 10 years they have bred there. To judge from old nests, about 73% of nests produced young. Ratio of young to adults was 3.5:2, to judge from ground counts; and 2.9:2, to judge from aerial photos. Running down young for banding was stopped because this seriously broke up family groups and exposed young to predation. The entire colony consisted of about 17,334 snow geese in 1957. In flocks without young, there were 60 of white phase to 100 blue; in flocks with young, the ratio was 49 white to 100 blue. The difference is thought to represent concentration of hunters on white birds; if so, blues will dominate more and more. Canada geese and brant were seen along the coast but did not breed there. Canadas traveled a few miles inland to molt. Richardson's geese, however, remained with the snow geese during molt. Brant molted offshore. Commonest dabbling ducks were pintail and black. Uncommon were greenwing teal, mallard, and baldpate. Strip counts made from ground indicated that there were about 54 game ducks per sq. mi. in 1 area and about 89 in another. Notes are given on status of diving ducks.

Nesbit, Rolland. (Wis. Cons. Dept.) [USE OF MECHANICAL GOOSE CALLER FOR MANAGEMENT PURPOSES.] Wis. Cons. Bul. 24(4): 23. Apr. 1959.

"A modified goose caller, run on a 12-volt battery, was used at Powell marsh last fall in an effort to increase the use of this area and it appeared to be very effective. The number of wild geese present on October 5, the day the caller was hooked up, was 82. This was increased to 280 over night and continued to increase to a maximum estimate of 12,000 on October 26... Of the two calls used, simulating feeding and flying geese, the flight call was most effective."

O'Meara, D. C. (U. Maine, Orono.) THE ABSENCE OF GROSS SYMPTOMS IN LEUCOCYTOZOON-INFECTED PENREARED BLACK AND RING-NECKED DUCKS. Trans. NE. Wildl. Conf., 1: 173. 1958 (1959). [Abstract only.]

Schierbaum, Donald, Dirck Benson, Lee W. DeGraff, and Donald D. Foley. (N. Y. State Cons. Dept.) WATERFOWL BANDING IN NEW YORK. N. Y. Fish & Game J. 6(1): 86-102, 3 figs. Jan. 1959.

"Waterfowl banding has been done in New York nearly every year since 1917. In 1947, an expanded program to band wild stock was undertaken. Trapping stations were located to sample the major population segments using the State's water areas. While the great majority of the birds banded were marsh ducks, diving ducks were also trapped successfully. In all, 74,139 waterfowl were banded from 1945 to 1957, and 10,981 were subsequently retaken and reported. From these records, flight routes to and across New York are described. Rates of recapture are discussed. Needs for additional banding work to help solve waterfowl management problems are outlined. The trapping and banding methods used are also described."--Auth. abst.

Stewart, Paul A. (US F&WS, Room 304, Post Office Bldg., Gadsden, Ala.) THE "ROMANCE" OF THE WOOD DUCK. Aud. Mag. 61(2): 62-65, 3 figs. Mar.-Apr. 1959.

Popular summary of what the author learned about local and migratory travels of wood ducks by study of banding returns and by field work. Females tend to return to their places of origin and may use the same nesting cavities year after year. Young ♀♀ arrive later than adults and may not nest at their places of origin. Males mate on wintering grounds and follow the ♀♀ wherever they go, which may be far from the males' places of origin. Male leaves ♀ after eggs hatch and joins other ♂♂ in flocks of 20-30. In fall, wood ducks of a locality gather into groups of 100-150 birds, then spread out in all directions for distances of 20 miles, some much farther. Most wood ducks migrate southward in late fall, but some remain in North all winter. West Coast birds winter in n. Calif. Eastern birds mostly winter in southern swamplands. New England birds follow a definite flight lane on the coastal plain, but midwestern birds migrate over a broader front. Winter food is largely acorns, and s. edge of winter range corresponds to s. limit of range of several species of oaks. Migration northward starts in Feb. and breeding grounds are reached in March, or, farther n., in April. Of birds shot, 69.3% were killed within 1 year after banding. After first year, mean annual mortality rate was 35.7%. The mean annual mortality rate for all years, except the last, was 38.3%.

Teploff, V. P., and N. N. Kartasheff. (Okski State Preserve & Biology-Soil Faculty of M. V. Lomonosoff Moscow State U., USSR.) BIOLOGICAL BASES FOR WATERFOWL HUNTING REGULATIONS IN THE CENTRAL PROVINCES OF THE EUROPEAN PART OF THE USSR. Translation by J. M. MacLennan, Can. Wildl. Serv., 18 p., processed, from Zool. Zh. 35(1): 77-88. 1956. Single copies of transl. available on request to Can. Wildl. Serv., Ottawa, while supply lasts.

This paper was also translated by D. D. Harber and appeared in 9th Ann. Rep. Wildfowl Trust, p. 157-169. It was abstracted at length in WR 92 p. 85.

Weidmann, U. BEHAVIOR STUDIES OF THE MALLARD. II. RESEARCH ON RELEASING AND IMPRINTING OF THE FOLLOWING AND FLOCKING REACTIONS. Z. Tierpsych. 15: 277-300. 1958. [From review by W. C. D., Auk 76(2).]

In German with English summary. Presents results of critical experiments on following and flocking responses of 50 mallard ducklings. Theoretical aspects of imprinting are discussed helpfully. The review cited above mentions some of the conclusions.

Winner, Robert W. (Miami U., Oxford, Ohio.) FIELD-FEEDING PERIODICITY OF BLACK AND MALLARD DUCKS. J. Wildl. Mgt. 23(2): 197-202. Apr. 1959.

Periodicity of field feeding of mixed populations of Anas rubripes and Anas platyrhynchos is described; the relationship of variations in this periodicity to certain environmental and social factors is discussed. Time of initiation of the first daily afternoon flights varied from 9 to 205 minutes before sunset. These flights began under light varying from 2.2 to 1,000 foot-candles. There was significant correlation between time at which afternoon flights began and size of population. Also, there was a significant correlation between time of afternoon flight and % of mallards in population. Afternoon flights began earlier in relation to time of sunset as population size and/or percentage of mallards in population increased. No relationship was found between time

afternoon flights began and either mean daily temperature or time at which waterfowl shooting hours ended. There was no relationship between initiation of afternoon feeding flights and absolute values of light intensity, but a more complex relationship between these 2 variables is possible.--Author.

CRANES, RAILS, SHOREBIRDS

Belopolski, L. O. ECOLOGY OF THE COLONIAL SEA BIRDS OF THE BARENTS SEA. Acad. Sci. USSR, Moscow. 460 p., 135 figs., 16 pl. 1957. 22 roubles. (Procurable Am-Rus Literary & Music Agency, 24 W. 45 St., N. Y. 36, N. Y.) [From review by Charles Vaurie, Auk 76(2).]

In Russian only. "This well-illustrated book discusses the ecology in northern Russia of eighteen, mostly Holarctic birds: Fulmar, Great Cormorant, Shag, Common Eider, Parasitic Jaeger, Kittiwake, Ivory Gull, Mew Gull, Great Black-backed Gull, Herring Gull, Glaucous Gull, Arctic Tern, Common Puffin, Dovekie, Black Guillemot, Thick-billed Murre, Common Murre, and Razorbill. Unfortunately, the scientific names are mentioned only in the preliminary pages on distribution and in the index. Arrival dates, nesting behavior, development of young, food, interspecific competition, are among the subjects treated, with many tables, graphs, diagrams, and photographs. Those working on Arctic and Sub-Arctic birds will find the book useful."

Blankenship, Lytle Houston. INVESTIGATIONS OF THE AMERICAN WOODCOCK IN MICHIGAN. Ph.D. thesis, Mich. State U. 244 p. 1957. [From long abstract in Dissertation Abstracts 19(11).]

See WR 95 p. 90, or longer abstract in the issue of Dissertation Abstracts cited above.

Burton, John H., II. SOME POPULATION MECHANICS OF THE AMERICAN COOT. J. Wildl. Mgt. 23(2): 203-210, 1 map. Apr. 1959.

Adult survival rate for Fulica americana in e. N. Am. is calculated to be 43% ± 6%. Band recoveries support the concept that birds wintering on the se. coast have crossed the n. part of the Miss. Valley. Aging of coots by tarsal color was investigated with the aid of Munsell color charts and Munsell notation. Comparison of color classes with survival data suggests that birds with yellow-green tarsi are young birds and not yearlings. Identification of sex by length of tarsus and toe is discussed. Sampling results suggest a sex and age differential migration in populations migrating through Wis. and Ill.--Author.

Chapin, James P., and Leonard W. Wing. (Am. Mus. Nat. Hist., N. Y. 24, N. Y.) THE WIDEAWAKE CALENDAR, 1953 TO 1958. Auk 76(2): 153-158, 2 figs. Apr. 1959.

"The Sooty Terns or Wideawakes (Sterna fuscata) of Ascension Island in the Atlantic (7° 57' South, 14° 22' West) since 1941 show a breeding cycle corresponding to the period of ten lunar months. This suggests an internal rhythm triggered or regulated by the night-activity of Wideawakes during the brightness of the tenth lunar month. Egg-laying dates between 1953 and 1958 show that the birds have continued the breeding rhythm previously shown for 1941-1952. It is suggested that other non-annual rhythms may be expected of birds in the narrow equatorial belt where seasons are all but nonexistent."

Koridon, J. A. F. HET ZWARTE MEER (RAYON-WEST). Limosa 31: 1-17. 1958. [From notice by E. Eisenmann, Auk 76(2).]

Dutch with English summary. This report on bird banding at a Dutch reserve states that eelbaskets were particularly effective in capturing rails.

Wilcox, LeRoy. (Speonk, L. I., N. Y.) A TWENTY YEAR BANDING STUDY OF THE PIPING PLOVER. Auk 76(2): 129-152, 9 photos on 2 pl. Apr. 1959.

Wilcox has banded 1,504 of the 2,377 piping plovers banded in the U. S. Here he presents what he has learned about trapping, constancy of pairs, return to breeding areas, nature of nesting areas, territory, nesting, eggs, incubation, hatching success, young, behavior, longevity, sex and age differences, weights and measurements, and dubious status of the belted subspecies.

OTHER BIRDS

Anderson, Anders H., and Anne Anderson. (3221 Kleindale Rd., Tucson, Ariz.) LIFE HISTORY OF THE CACTUS WREN. PART II. THE BEGINNING OF NESTING. Condor 61 (3): 186-205, 4 figs. May-June 1959.
Breeding territory, territorial behavior, function of territory, nest, factors affecting time of laying.

Bakus, Gerald J. (U. Wash., Seattle 5.) OBSERVATIONS ON THE LIFE HISTORY OF THE DIPPER IN MONTANA. Auk 76(2): 190-207, 1 map. Apr. 1959.
Swimming, flight, foods, feeding, general habits, singing, pairing, nesting, incubation, care of young, productivity, immature plumages.

Barney, Merle D. (US F&WS, Lakeport, Calif.) RED-TAILED HAWK KILLING A LAMB. Condor 61(2): 157-158. Mar.-Apr. 1959.

Birkenholz, Dale. (S. Ill. U., Carbondale.) NOTES ON A WINTERING FLOCK OF LONG-EARED OWLS. Trans. Ill. State Acad. Sci. 51(1/2): 83-86, 1 graph. 1958.
A flock was studied on a strip-mined research area in s. Ill. from Dec. 29, 1956 to Apr. 8, 1957. Roosts av. 6 trees in extent and covered not more than 250 sq. ft. A total of 1,314 pellets was analyzed. There was an av. of 1.7 food items per pellet. Small mammals constituted 98% of diet. Chief prey species were, in order of importance: Microtus ochrogaster, Cryptotis parva, Peromyscus sp., Mus musculus. Composition of diet changed gradually during winter.

Eyer, Lester Emery. A LIFE-HISTORY STUDY OF THE BRONZED GRACKLE, QUISCALUS QUISCULA VERSICOLOR VIEILLOT. Ph.D. thesis, Mich. State U. 213 p. 1954. [From long abstract in Dissertation Abstracts 19(11).]

French, Norman R. (Atomic Energy Comm., Idaho Falls, Idaho.) LIFE HISTORY OF THE BLACK ROSY FINCH. Auk 76(2): 159-180, 4 photos on 2 pl. Apr. 1959.
Report of 3-year study of Leucosticte tephrocotis atrata in mountains of Wyo. and Utah. Among subjects discussed are: display, territory, nesting, incubation, care of young, development of young, aggregations of young, voice, food, effect of food on breeding, flocking, winter roosts, shortage of ??, plumages, and coloration.

Ingram, Collingwood. (The Grange, Benenden, Cranbrook, Eng.) THE IMPORTANCE OF JUVENILE CANNIBALISM IN THE BREEDING BIOLOGY OF CERTAIN BIRDS OF PREY. Auk 76(2): 218-226, 1 pl. Apr. 1959.
Evidence that cannibalism among brood mates is relatively common in certain species of raptorial birds. He believes this has definite survival value at times of food shortage. Cannibalism depends on the fact that broods generally are of uneven size and age, so that there are some small siblings to be eaten. When food is abundant, some species provide an excess of food around the nest, which makes cannibalism unlikely, and results in larger numbers of young fledged.

Meanley, Brooke. (Patuxent Refuge, Laurel, Md.) NOTES ON BACHMAN'S SPARROW IN CENTRAL LOUISIANA. Auk 76(2): 232-234, 1 pl. Apr. 1959.
Habitat, beneficial effects of forestry practices, food, nesting.

Simmons, Edward M. (Avery Is., La.) OBSERVATIONS ON EFFECTS OF COLD WEATHER ON NESTING COMMON EGRETS. Auk 76(2): 239-241. Apr. 1959.
"These observations appear to indicate that sub-freezing weather is disrupting to nesting Common Egrets and may cause abandonment of the nests if nesting has not progressed sufficiently. However, Common Egret eggs can apparently survive periods of freezing temperatures if the parent birds remain in attendance."

REPTILES AND AMPHIBIANS

Bagnara, Joseph T., and Jerry J. Kollros. (U. Iowa, Iowa City.) ABBREVIATED LARVAL PERIOD OF RANA CATESBEIANA IN IOWA. Proc. Iowa Acad. Sci. 63: 729-731. 1956. [From Biol. Abst. 33(7).]
Bullfrogs of Iowa have a larval period of only 1 year; in some other localities at least 2 years are spent in the larval condition. Great differences in temperature do not exist between this part of Iowa and regions where 2-year larvae are reported.--Auth. discussion.

Bogert, Charles M. (Am. Mus. Nat. Hist., N. Y. 24, N. Y.) HOW REPTILES REGULATE THEIR BODY TEMPERATURE. Sci. Am. 200(4): 105-108, 111-112, 115-116, 118, 120, 12 figs. Apr. 1959.

Good general account of this subject; so written as to be comprehensible to non-specialists.

Bush, Francis M. (U. Ky., Lexington.) FOODS OF SOME KENTUCKY HERPTILES. Herpetologica 15(2): 73-77. June 1959.

Good report of food items found in from 3 to 20 specimens of: Bufo t. americanus, Bufo w. fowleri, Rana catesbeiana, Rana clamitans, Chelydra serpentina, Terrapene carolina, Natrix sipedon, Diadophis punctatus, Carphophis amoenus, Opheodrys aestivus, Ancistrodon contortrix, and Crotalus horridus.

Caldwell, David K., Archie Carr, Larry H. Ogren, Frederick H. Berry, and Robert A. Ragotzkie. THE ATLANTIC LOGGERHEAD SEA TURTLE, CARETTA CARETTA CARETTA (L.), IN AMERICA. Bul. Fla. State Mus., Biol. Sci., 4(10): 293-348, 23 figs. June 1959. 70¢ from Fla. State Mus., Seagle Bldg., Gainesville.

Contains 3 papers. I. Nesting and migration of the Atlantic loggerhead turtle. Tagging has shown that ?? may travel as much as 1000 miles from the nesting beach in 10 months. Nesting procedure is described. Loggerheads usually nest in aggregations on given stretches of beach. They mate in the water just off nesting beaches. There is no correlation between size of turtle, time of laying, or number of eggs laid. Main nesting range of C. c. caretta is mainland coast from Cape Lookout, N. C., to Mexico, but emergences elsewhere have been recorded. II. Multiple and group nesting by the Atlantic loggerhead turtle. Tagging and dissection show that individuals nest several times in the same summer on the same stretch of beach. It is not known whether or not an individual lays each year. Turtles navigate to their breeding places with some precision. Groups of turtles nest together several times, and it is believed they stay together during the periods between the nesting emergences. III. The loggerhead turtles of Cape Romain, South Carolina. This paper was edited by Caldwell but was written by Wm. P. Baldwin, Jr. and John P. Lofton, Jr., who did the work and surely should have been listed as authors. The article is a detailed study of nesting biology. Females make exploratory trips to the beach and may or may not lay on any one trip. They will, however, lay soon in the vicinity. There is no correlation between nesting and stage of moon, tide, or weather. Physical features of the beach are important factors in nesting activity. Details are presented on nests, eggs, incubation, growth rate, and hatching. Many of the hazards and difficulties faced by the eggs and young are discussed. Variations in form and color of hatchlings are described.

Carpenter, Charles C. (U. Okla., Norman.) A POPULATION OF THE SIX-LINED RACERUNNER (CNEMIDOPHORUS SEXLINEATUS). Herpetologica 15(2): 81-86, 3 figs. June 1959.

Study of a population in s.-cent. Okla. Takes up: methods of capture, growth rate, seasonal activity, persistence of individuals on study area, numbers seen and estimated, movements of individuals.

Clarke, Robert F. (Kans. State Teach. Coll., Emporia.) POISONOUS SNAKES OF KANSAS. Kansas School Naturalist 5(3). 16 p., illus. 1959. 25¢ from Kans. State Teach. Coll., Emporia. [From Monthly Checklist of State Publications 50 (5).]

Cliburn, J. Wm. (Miss. S. Coll., Hattiesburg.) THE DISTRIBUTION OF SOME MISSISSIPPI LIZARDS. Am. Midl. Nat. 61(2): 414-418. Apr. 1959.

Localities for 11 species and taxonomic notes on Sceloporus and Ophisaurus.

Dowling, Herndon G. (U. Ark., Fayetteville.) CLASSIFICATION OF THE SERPENTES: A CRITICAL REVIEW. Copeia 1959(1): 38-52, 4 figs. Apr. 1959.

Eakin, Richard M., Robert C. Stebbins, and Daniel C. Wilhoft. (U. Calif., Berkeley.) EFFECTS OF PARIETALECTOMY AND SUSTAINED TEMPERATURE ON THYROID OF LIZARD, SCELOPORUS OCCIDENTALIS. Proc. Soc. Exp. Biol. & Med. 101(1): 162-164, 1 fig. May 1959.

"Taking these several findings together it seems probable that the parietal eye, hypophysis, and thyroid are somehow linked together in the physiology and behavior of this lizard in relation to solar radiation."

Gislén, Torsten, and Hans Kauri. (Kauri: Zool. Inst., Lund, Sweden.) ZOOGEOGRAPHY OF THE SWEDISH AMPHIBIANS AND REPTILES WITH NOTES ON THEIR GROWTH AND ECOLOGY. Acta Vertebratica 1(3): 190-397, 69 figs. 1959. 40 Swedish kronor from Nordiska Museet & Skansen, Stockholm.

Sweden has the surprising total of 12 species of amphibians and 6 species of reptiles, although the nation lies as far north as Alaska. The distribution of these animals in Sweden is analyzed in detail in this volume of 207 pages. Many thousands of locality records are listed and mapped. The resulting information is discussed zoogeographically in connection with information about general distribution of each species, postglacial land connections, climatic fluctuations, and changes in status of species. Available data on ecology and natural history of the species in Sweden are also presented. The amount of such information naturally varies with the abundance of the species and the number of serious studies it has received. There are, for example, long discussions of neoteny and taxonomy under Triturus vulgaris. Growth is considered for several species, as is tolerance of salinity. Variation in color patterns is pointed out for all forms in which it is important, and is shown by photographs. The volume ends with an essay on invasion routes and distribution of each species, and with a bibliography of 13 p.

Grant, Martin L., and L. J. Henderson. (Iowa State Teachers Coll., Cedar Falls.) A CASE OF GILA MONSTER POISONING WITH A SUMMARY OF SOME PREVIOUS ACCOUNTS. Proc. Iowa Acad. Sci. 64: 686-697, illus. 1957. [From Biol. Abst. 33(6).]

A clinical description of a comparatively mild case of toxemia resulting from the bite of an adult captive Gila monster (Heloderma suspectum). Symptoms and laboratory findings are presented in detail. An analysis of 24 previously-published accounts is presented. Symptoms are tabulated and compared. The question as to whether Gila monster bites can be fatal to a "normal" person is left open.--From auth. summ.

Klimstra, W. D. (S. Ill. U., Carbondale.) FOOD HABITS OF THE COTTONMOUTH IN SOUTHERN ILLINOIS. Chicago Acad. Sci., Nat. Hist. Misc. no. 168. 1-8 p., 1 graph. May 1959.

Based on analysis of contents of 84 digestive tracts. Results are reported in detail. Fishes were the chief foods, followed by amphibians, reptiles, mammals, and gastropods. There was no clear seasonal trend in food habits, but there was in food intake. Intake dropped in summer, even in gravid ??. Although the types of food taken were relatively constant during the year, they reflected availability of the food organisms in relation to the habits of the cottonmouths.

Langebartel, David Lee. THE COMPARATIVE MORPHOLOGY OF THE HYOID IN SNAKES, AND ITS ASSOCIATED MUSCLES. Ph.D. thesis, U. Ill. 231 p. 1958. [From long abstract in Dissertation Abstracts 19(11).]

Includes discussion and proposals concerning classification of families.

Laughlin, Harold E. (U. Texas, Austin.) STOMACH CONTENTS OF SOME AQUATIC SNAKES FROM LAKE McALESTER, PITTSBURGH COUNTY, OKLAHOMA. Texas J. Sci. 11(1): 83-85. Mar. 1959.

37 snakes of 6 species were examined: 23 Natrix taxispilota, 4 N. erythrogaster, 4 N. sipedon, 3 N. grahami, 1 Thamnophis sauritus, and 2 Ancistrodon piscivorus. Of these, only 18 contained identifiable food material. The snakes were taken by sportsmen engaged in a snake-elimination program. Study of stomach contents gave no indication that control of the snakes was needed or desirable.

Littlejohn, Murray J., and Ted C. Michaud. (U. Texas, Austin.) MATING CALL DISCRIMINATION BY FEMALES OF STRECKER'S CHORUS FROG (PSEUDACRIS STRECKERI). Texas J. Sci. 11(1): 86-92. Mar. 1959.

Ripe females distinguished very well between calls of their own species and those of related species. They moved directly to the machine when the right calls were played. Call recognition is important in promoting efficient intraspecific mating.

Martof, Bernard S., and Robert L. Humphries. (U. Ga., Athens.) GEOGRAPHIC VARIATION IN THE WOOD FROG RANA SYLVATICA. Am. Midl. Nat. 61(2): 350-389, 14 figs. Apr. 1959.

A detailed study of this frog throughout its range. Several characters vary geographically and various geographic types of wood frogs can be distinguished. The authors do not feel that subspecies treatment is appropriate or sound. The "rules" of Bergmann, Allen, and Gloger apply poorly to this animal and in general tend to impede genuine understanding.

McAlister, Wayne H. (U. Texas, Austin.) THE VOCAL STRUCTURES AND METHOD OF CALL PRODUCTION IN THE GENUS SCAPHIOPUS HOLBROOK. Texas J. Sci. 11(1): 60-77, 6 figs. Mar. 1959.

Mullally, Don P. (San Fernando High School, Los Angeles, Calif.) NOTES ON THE NATURAL HISTORY OF RANA MUSCOSA CAMP IN THE SAN BERNARDINO MOUNTAINS. Herpetologica 15(2): 78-80. June 1959.

Habitat, metamorphosis, effect of drought, winter temperature relations, body temperatures, diurnality.

Musacchia, X. J. (St. Louis U., Mo.) THE VIABILITY OF CHRYSEMYS PICTA SUBMERGED AT VARIOUS TEMPERATURES. Physiol. Zool. 32(1): 47-50. 1959. [From Biol. Abst. 33(6).]

See abst. in Biol. Abst. 33(6).

Neill, Wilfred T. (Ross Allen Reptile Inst., Silver Springs, Fla.) THE OCCURRENCE OF AMPHIBIANS AND REPTILES IN SALTWATER AREAS, AND A BIBLIOGRAPHY. Bul. Marine Sci. Gulf and Caribbean 8(2): 1-97. 1958. [From Biol. Abst. 33(5).]

Occurrence of salamanders, frogs, turtles, crocodilians, lizards, snakes and 1 tuatara in the saltwater areas of the world are discussed. Previously published accounts are summarized, and new findings are presented. At least 52 species or subspecies of amphibians, and 273 of reptiles either dwell habitually in haline habitats or occasionally invade them. Such habitats are classified from a herpetological standpoint. In Florida a remarkably large number of essentially freshwater or inland species have also taken up residence in saltwater situations. An explanation of this circumstance is seen in both geological history and present ecological conditions here. Two areas of Florida-Merritt Isl. in Brevard County and mouth of St. Johns River in Duval County are described as having an unusually large saltwater herpetofauna. Residence in a saltwater habitat is apt to bring about changes in coloration of an amphibian or reptile. Morphological changes also may be brought about; diet is affected. Bibliography of 475 titles.--Author.

Parrish, Fred K. (Emory U., Emory U., Ga.) MISCELLANEOUS OBSERVATIONS ON THE BEHAVIOR OF CAPTIVE SEA TURTLES. Bul. Marine Sci. Gulf and Caribbean 8(4): 348-355. 1958. [From Biol. Abst. 33(7).]

Behavior of 4 species of sea turtles was observed for 4.5 months in tanks at Marineland, Fla. Turtles were not aggressive, showed definite respiratory patterns, and exhibited varying degrees of territoriality. Feeding, sleeping, swimming, and other characteristics are discussed.--From auth. abst.

Parrish, Henry M., and James E. Scatterday. (Scatterday: Fla. Bd. Health, Jacksonville.) A SURVEY OF POISONOUS SNAKEBITES AMONG DOMESTIC ANIMALS IN FLORIDA. Vet. Med. 52(3): 135-139, 4 figs. Mar. 1957.

"1. A questionnaire sent to the practicing veterinarians in Florida showed an average of 360 poisonous snakebites among domestic animals are treated each year. Dogs were the most frequent victims. There was a 25.9% mortality among this group of treated animals. 2. Most animals were bitten on the head and

face, shoulders, forelegs, neck, chest, and hindlegs. Poisonous snakebites occur more frequently during the spring and summer months rather than during the hunting season. 3. Recent trends in the treatment of snake-venom poisoning are discussed, and tourniquet, incision and suction, antivenin, antibiotics, and tetanus and gas gangrene antitoxin are recommended for treating venom poisoning in animals."--Authors' summary. Another statement is of special interest: "We are in complete agreement with Shannon who rejects the L-C treatment in toto."

Ragotzkie, Robert A. (U. Wis., Madison.) MORTALITY OF LOGGERHEAD TURTLE EGGS FROM EXCESSIVE RAINFALL. Ecology 40(2): 303-305, 1 graph. Apr. 1959.
Conclusion: "During most years eggs laid by the third week in June would probably produce young. Eggs laid after 1 July would have a poor chance of survival in most years because of the September rains. Since the eggs in both 1955 nests were deposited after 1 July, the mortality was to be expected. However, the 100% mortality of Loggerhead eggs observed in 1957 was unusual in that it resulted from excessive July rainfall concentrated in a period of a few days." These conclusions pertain to the coast of Ga.

Sexton, Owen J. (Washington U., St. Louis, Mo.) SPATIAL AND TEMPORAL MOVEMENTS OF A POPULATION OF THE PAINTED TURTLE, CHRYSEMYS PICTA MARGINATA (AGASSIZ). Ecol. Monog. 29(2): 113-140, 10 figs. Apr. 1959.
A population of about 1,000 individuals was studied at a pond in s. Mich. In prevernal season, March 15-25, turtles left hibernation but were not very active. In spring, March 26-May 31, turtles emigrated from pond to other waters. Travels were at times of high water. More adults than juveniles emigrated, and more ♀♀ than ♂♂. Remaining turtles concentrated about the 4 sunning spots. In summer the emigrants gradually returned to the pond. They concentrated where vegetation reached water surface, especially where vegetation formed mat at surface. This type of vegetation governed occurrence of Chrysemys, and its density influenced size of turtle using it: larger turtles preferred denser mats that supported them better. Area of activity of an individual turtle was not restricted to one locale. An individual might or might not return to areas used in previous year. Chrysemys appeared to be adaptable to varying conditions, ready to move about, rather than being sedentary. In particular, they moved about until they found spots that had the vegetation type that suited them. In autumn the turtles tended to move to deeper waters, and there was emigration under certain conditions.

Shaw, Morris H. BUZZTAIL LEATHER. Fla. Wildl. 13(1): 28-29, 37, 6 photos. June 1959.
How to tan rattlesnake skins by treatment with: 1) salt, 2) lime solution, 3) salt-alum bath, 4) neatsfoot oil, 5) breaking over the beam.

Stahnke, Herbert L. THE TREATMENT OF VENOMOUS BITES AND STINGS. Poisonous Animals Research Laboratory, Ariz. State Coll., Tempe. 1-51 p., 14 figs. 1958. 50¢.
A full account of the Ligature-Cryotherapy method of treating snakebite, scorpion stings, etc. Things to be done and things to be avoided are discussed in detail. Clinical reports are included. Criticisms of the L-C method are answered. [The booklet seems quite convincing, but prospective users of the L-C method should be aware that a number of experts on snakebite are highly critical of this treatment. At best, the L-C method must still be termed controversial.]

Tanner, Wilmer W. (Brig. Young U., Provo, Utah.) A TAXONOMIC AND ECOLOGICAL STUDY OF THE WESTERN SKINK (EUMECES SKILTONIANUS). Great Basin Naturalist 17 (3/4): 59-94, illus. Dec. 1957.
Three subspecies, 2 new, are characterized. Ecology and life history are discussed under the headings: Habitat, Habits and behavior, Feeding habits, Reproduction, Sexual variations, Age variations, Predators and parasites.

Turner, Frederick B. (Wayne State U., Detroit 2, Mich.) AN ANALYSIS OF THE FEEDING HABITS OF RANA P. PRETIOSA IN YELLOWSTONE PARK, WYOMING. Am. Midl. Nat. 61(2): 403-413. Apr. 1959.

Detailed account of stomach contents. Availability clearly plays a large part in determining what is eaten, but the existence of some preferences cannot be ruled out. The nature of certain food items indicates that the frogs may feed under water, as both R. pipiens and R. clamitans have been judged to do.

Turner, Frederick B. (Wayne State U., Detroit 2, Mich.) SOME FEATURES OF THE ECOLOGY OF BUFO PUNCTATUS IN DEATH VALLEY, CALIFORNIA. Ecology 40(2): 175-181, 3 figs. Apr. 1959.

Study of a very small, very local population. Deals with time of activity, relation of temperature to activities, population density and its seasonal variations, travels, isolation of population.

Volpe, E. Peter. (Newcomb Coll., Tulane U., New Orleans, La.) EXPERIMENTAL AND NATURAL HYBRIDIZATION BETWEEN BUFO TERRESTRIS AND BUFO FOWLERI. Am. Midl. Nat. 61(2): 295-312, 5 figs. Apr. 1959.

Zweifel, Richard G. (Am. Mus. Nat. Hist., N. Y. 24, N. Y.) VARIATION IN AND DISTRIBUTION OF LIZARDS OF WESTERN MEXICO RELATED TO CNEMIDOPHORUS SACKI. Bul. Am. Mus. Nat. Hist. 117(2): 57-116, 7 pl., 6 figs. Apr. 1959. $1.25, paper.

Detailed taxonomic study of a group of lizards that is well represented in the sw. U. S. The group is difficult and has been subject to many changes in recent years.

FISHES

Slastenenko, E. P. (U. Toronto, Ont.) THE FRESHWATER FISHES OF CANADA. Kiev Printers, Toronto, Ont. 385 p., illus. 1958. $15.00. [From review by Alex Calhoun, Calif. Fish & Game 45(2).]

"Mr. Slastenenko has gathered together and abstracted the published information on Canadian freshwater fishes. His book contains a section on each species, which includes a synonymy, a detailed description, and general information on size, habitat, food habits, and commercial value. Growth rates are illustrated for some of the more important fish. Most species are illustrated. The drawings were borrowed from other authors and they have suffered greatly in the process. There are keys to the families, genera, and species; a glossary, and a distributional summary in tabular form. The text has more than its share of typographical errors."

Wilimovsky, Norman J. PROVISIONAL KEYS TO THE FISHES OF ALASKA. Fisheries Res. Lab., US F&WS, P. O. Box 2021, Juneau, Alaska. 113 p. May 1958. [From review by Vladimir Walters, Copeia 1959(1).]

Keys to 398 species; also indications of distribution.

INVERTEBRATES

Hobbs, Horton H., Jr., and C. W. Hart, Jr. (U. Va., Charlottesville.) THE FRESHWATER DECAPOD CRUSTACEANS OF THE APALACHICOLA DRAINAGE SYSTEM IN FLORIDA, SOUTHERN ALABAMA, AND GEORGIA. Bul. Fla. State Mus., Biol. Ser., 4(5): 145-191, 39 figs., 8 maps. May 1959. 60¢ from Fla. State Mus., Seagle Bldg., Gainesville.

Includes keys, illustrations of diagnostic features, spot maps, notes on habitats, discussion of origin of fauna, and species accounts that provide diagnostic and color data as well as notes on ecology and life history.

Penn, George Henry. (Tulane U., New Orleans, La.) AN ILLUSTRATED KEY TO THE CRAWFISHES OF LOUISIANA WITH A SUMMARY OF THEIR DISTRIBUTION WITHIN THE STATE. Tulane Stud. Zool. 7(1): 3-20, 86 figs., 12 maps. Apr. 1959. 60¢.

AUTHOR INDEX

	Page
Ackerman, Edward A.	2
Adams, Lowell	28,37
Aikman, J. M.	25
Aldous, Shaler E.	20
Alexander, Maurice M.	15
Allan, Philip F.	25
Allen, Jack	37
Ammons, Nelle P.	6
Anderson, Anders H.	70
Anderson, Anne	70
Anderson, C. E.	15
Anderson, Chester C.	48
Anderson, Kling L.	26
Anderson, Sydney	34
Angier, Bradford	17
Arasaki, S.	21
Arata, Andrew A.	45
Arndt, Christian O.	4
Bagnara, Joseph T.	70
Bailey, James	28
Baker, Maurice F.	12
Bakus, Gerald J.	70
Banfield, A. W. F.	49
Barabash-Nikiforov, I. I.	53
Barlowe, Raleigh	2
Barney, Merle D.	70
Bartholomew, George A.	57
Bartlett, C. O.	51
Bartley, T. R.	21
Bauer, Robert V.	66
Beck, Robert A.	24
Bell, J. Frederick	35
Bellrose, Frank C.	65
Belopolski, L. O.	69
Belsky, P.	10
Benson, Dirck	68
Berry, Frederick H.	71
Betts, M. M.	57
Binhammer, R. T.	59
Birkenholz, Dale	70
Black, Hugh C.	46
Blaisdell, James P.	26
Blankenship, Lytle Houston	69
Bodenheimer, F. S.	9
Bogert, Charles M.	71
Bookhout, Theodore A.	38
Bopp, Peter	43
Borg, Karl	12
Boschetti, Mario M.	21
Bouvier, G.	35
Bovbjerg, Richard V.	33
Breiding, George H.	10
Briejèr, C. J.	12
Bronson, Franklin H.	38
Brooks, David M.	45
Browman, L. B.	52
Brown, Ellsworth R.	26
Brown, Frank A., Jr.	11
Brown, Robert L.	60
Browning, R. L.	66
Bruns, V. F.	15
Bry, Ed	63
Buckley, John L.	29
Burgisser, H.	35
Burton, John H., II.	69
Bush, Francis M.	71
Bushong, Clayton	38
Buss, Irven O.	49,51
Butterworth, B. B.	34
Byer, M. D.	15
Byrd, Mitchell A.	64
Byrnes, Wm. R.	30
Caldwell, David K.	71
Cantlon, J. E.	15
Carleton, G.	58
Carpenter, Charles C.	71
Carr, Archie	71
Castellano, M.	43
Chamberlain, Everett B.	24
Channing, C. H.	12,56
Chapin, James P.	69
Chapman, Douglas G.	15
Chappell, W. E.	33
Cheatum, E. L.	17
Chew, R. M.	34
Christ, John C.	29
Christian, John J.	34
Clarke, Robert F.	71
Clawson, Marion	2
Clawson, Sterling G.	12
Cliburn, J. Wm.	71
Cofer, Henry P.	24
Conaway, C. H.	36
Conn, Hugh R.	17
Constantine, Denny G.	19
Cooch, Frederick Graham	65
Cook, David B.	30
Cookingham, Russell A.	61
Core, Earl L.	6,8
Cowan, I. McT.	44
Criley, Walter L.	25
Crowcroft, Peter	36
Dahlgren, Robert	62
Dane, Charles W.	21
Daniell, Paul M.	63
Dansereau, Pierre	22
Dawe, A. R.	33
Day, Maurice W.	27
Decker, Eugene	10
DeGraff, Lee W.	68
Delacour, Jean	62
Deliamure, S. L.	53
DeSelm, H. R.	6
Dexter, Ralph W.	38
Dickey, Charley	61
Dietz, D. R.	26
Dodds, Donald G.	38,49
Dodge, Wendell E.	40
Donaldson, John C.	51
Dorofeev, S. V.	53,54
Doutt, J. Kenneth	51
Dowling, Herndon G.	71
Downing, Robert L.	16
Dudok van Heel, W. H.	54
Duisberg, Peter	6
Duman, Maximilian	6

Page

Dutilly, Arthème 6
Eakin, Richard M. 72
Eipper, Alfred W. 22
Elder, James B. 53
Elliot, G. H. 54
Emery, K. O. 25
Erickson, A. W. 47
Eyer, Lester Emery 70
Ferguson, Roland H. 8
Feuer, R. C. 34
Figueroa Potes, Adalberto 13
Fisher, K. C. 40
Fitzgerald, C. P. 22
Fletcher, J. R. 60
Flinn, Paul 49
Flyger, V. F. 44
Foley, Donald D. 68
Freimann, S. 54
French, Norman R. 70
Funderburg, John B., Jr. 59
Furniss, Robert L. 13
Fyvie, A. 45
Generosoff, V. T. 65
George, John L. 13
Gibb, J. A. 57
Giesy, Robert M. 6
Gislén, Torsten 72
Glass, Bryan P. 36
Goehring, Harry H. 66
Goldston, E. F. 4
Goodrum, Phil D. 22,51
Goodwin, Richard H. 31
Graham, Samuel A. 34
Grant, Martin L. 72
Gratkowski, H. 26
Gray, Charles E. 22
Grayson, Janet 66
Grayson, Wm. 66
Grechman, Richard 34
Greeley, John R. 22
Grimshaw, H. M. 57
Hall, C. E. 59
Hall, Gustav W. 7
Hall, O. 59
Halls, L. K. 29
Hamilton, Rodger D. 44
Hamilton, W. J., Jr. 47
Hannan, E. J. 15
Hansen, Richard M. 40,41
Hanson, W. C. 66
Harrington, Fred A., Jr. 52
Hart, C. W., Jr. 75
Hart, George E. 30
Hartkorn, Fred 49
Henderson, L. J. 72
Henika, F. S. 17
Herbel, Carlton H. 26
Hesterman, E. R. 39
Hicks, Ellis A. 57
Hildebrand, J. E. 59
Hill, Clara Chapman 7
Hindwood, K. A. 57
Hine, Ruth L. 17
Hipschman, Don 5
Hobbs, Horton H., Jr. 75
Höhn, E. Otto 59

Page

Holm, Earl R. 61,62,66
Holz, Robert 62
Hooven, Edward 41
Howell, Thomas R. 57
Hudson, Paul 52
Humphries, Robert L. 73
Hutnik, R. J. 30
Ignoffo, Carlo M. 14,35
Ingles, Jean M. 36
Ingles, Lloyd G. 41
Ingram, Collingwood 70
Jackson, Harry G. 23
Jackson, Hartley H. T. 49
Jahn, Laurence R. 52
Janes, Donald W. 38
Jellison, Wm. L. 35
Jensen, E. R. 4
Jensen, Jens A. 19
Jobbins, Daniel M. 23
Karlog, Ole 13
Kartasheff, N. N. 68
Kauri, Hans 72
Kebbe, C. E. 45
Keener, John M. 19
Keenleyside, M. H. A. 13
Keil, W. 60
Keith, James O. 41
Keith, Lloyd B. 40
Kelker, George Hills 16
Kittams, Walter H. 49
Kitts, W. D. 44
Klimstra, W. D. 72
Kline, Paul D. 39
Klumov, S. K. 54
Knobloch, Eduard 63
Knorr, Owen A. 59
Knudsen, George J. 44
Kokeš, Otakar 63
Kollros, Jerry J. 70
Koridon, J. A. F. 69
Korschgen, Leroy J. 47
Kozlik, Frank M. 66
Krefting, L. W. 29
Krochmal, Arnold 6
Kruskal, W. H. 15
Kuyava, Gary C. 48
Labzoffsky, N. A. 45
Lack, David 60
Landau, B. R. 33
Langebartel, David Lee 72
Langer, H. 33
Langer-Schierer, H. 33
Larson, Carl L. 35
Latham, Wm. H. 17
Lathrop, Earl W. 7
Laughlin, Harold E. 72
Layne, James N. 16,41
Lechleitner, R. R. 39
Leighty, W. J. 4
Lemieux, Louis 67
LeMunyan, Cobert D. 34
Leonard, Justin W. 31
Lepage, Ernest 6
Lewis, James 64
Lewis, Mont E. 7
Li, Hui-Lin 7

	Page
Linhart, Samuel B.	47
Little, Silas	27,31
Littlejohn, Murray J.	73
Lockie, J. D.	48
Løf, George O. G.	2
Lord, Rexford D., Jr.	39
Lowenthal, David	5
Lull, H. W.	27
Lumsden, H. G.	67
Lytle, S. A.	4
Mace, R. U.	50
MacLennan, J. M.	17,46
Macpherson, Andrew H.	59
Mair, W. Winston	18
Mansfield, A. W.	54
Marshall, Charles M.	16
Martin, J. P.	13
Martin, Sylvan C.	3
Martof, Bernard S.	73
Marvin, Kenneth T.	16
Masson, Vic	63
Matsumoto, Koji	55
Maxfield, Herbert K.	39
McAlister, Wayne H.	73
McCarley, W. H.	41
McDonough, James J.	39
McDowell, Robert D.	19
McKean, Roland N.	3
McKeon, W. H.	23
McLaren, Ian A.	54,59
McNally, J.	61
Meanley, Brooke	70
Merkel, F. W.	57
Michaud, Ted C.	73
Miller, A. W.	66
Moir, David Ross	7
Moisan, Gaston	50,67
Møller, Knud O.	13
Montreuil, Paul-L.	55
Morris, D.	57
Mossman, H. W.	16
Motl, Laurence F.	14
Mountford, M. D.	55
Mowery, Irvin C.	4
Mozgovoi, A. A.	55
Mullally, Don P.	73
Musacchia, X. J.	44,73
Mykytowycz, R.	39
Nagasaki, Fukuzo	55
Needler, Mary E.	40,
Neill, Wilfred T.	73
Nesbit, Rolland	67
New, John G.	37
Newman, Duane E.	63
Nicholson, A. J.	14
Nicholson, E. M.	11
Niehuis, Charley C.	4
Niering, Wm. A.	31
Nikitina, N. A.	42
Nikulin, P. G.	55
Ogren, Larry H.	71
Olsen, Peter F.	45
O'Meara, D. C.	67
Orr, Howard D.	42
Osburn, William Sherman, Jr.	8
Osler, P. F.	19
Ovington, J. D.	57
Owen, Cora R.	35
Pamuska, Joseph Allan	44
Parker, Sheila	6
Parkes, K. C.	59
Parrish, Fred K.	73
Parrish, Henry M.	73
Parsons, S. H.	18
Paul, W. Adrian B.	59
Paur, Sherman	6
Pearson, Oliver P.	42
Pearson, Paul G.	35
Penati, F.	43
Penn, George Henry	75
Petrides, George A.	47
Pfeifer, S.	60
Phillips, Robert L.	5
Pierce, Madelene E.	23
Pikharev, G. A.	55
Pillsbury, Harold W.	19
Pimlott, Douglas H.	16
Polder, Emmett	34
Post, George	51
Powell, J. C.	4
Proescholdt, Mrs. Carl	57
Purchase, D.	39
Purves, P. E.	55
Quay, Thomas L.	59
Ragotzkie, Robert A.	71,74
Ramakrishnan, Alladi	15
Ray, Edward M.	5
Ray, Raymond J.	27
Reid, Vincent H.	51
Reilly, E. M., Jr.	59
Remson, Irwin	27
Renne, Roland G.	3
Reynolds, R. E.	61,62
Rienecker, Warren C.	66
Ripley, Thomas H.	61
Roberts, Rosemary	6
Robertson, Fred R.	52
Robinson, Franklin D.	8
Romanov, A. N.	16
Ross, W. G.	45
Rousseau, Roland F.	5
Rowan, Wm.	40
Rudd, Clayton G.	9,58
Russell, Norman H.	8,27,28
Ryzhikov, K. M.	55
Sabine, Winifred S.	58
Satterlund, Donald R.	34
Saville, Winston S.	46
Scagel, Robert F.	8
Scatterday, James E.	73
Schierbaum, Donald	68
Schmidt-Koenig, K.	58
Schneider, Edwin O.	23
Schneider, P. A.	35
Scott, M. L.	61,62
Sdobnikov, V.	55
Sears, H. S.	52
Sergeant, D. E.	55
Seubert, John	62
Severinghaus, C. W.	52

	Page
Sexton, Owen J.	74
Shanks, Royal E.	8
Shaw, Morris H.	74
Shepard, Paul, Jr.	14
Shepherd, H. R.	26
Sheppe, Walter A., Jr.	34
Simmons, Edward M.	70
Simon, Noel	11
Sjörs, Hugo	8
Skilling, D. D.	28
Slastenenko, E. P.	75
Sleptsov, M. M.	56
Smith, Arthur D.	27
Smith, Edward Ray	33
Smith, Lawrence S.	24
Smith, Robert Leo	35
Solf, J. David	49
Solman, V. E. F.	18
Sorrels, J. H.	24
Spencer, Donald Alexander	29,42
Springer, Paul F.	24
Srinivasan, S. K.	15
Stahnke, Herbert L.	74
Stains, Howard J.	47
Starrett, Wm. C.	23
Stebbins, Robert C.	72
Steenis, John H.	22,24
Steinhoff, Harold W.	63
Stevenson, A. B.	44
Stevenson, Robert E.	25
Stewart, Paul A.	68
Stiles, W. B.	33
Stoeckeler, J. H.	28
Storer, Tracy I.	20
Strausbaugh, P. D.	8
Strumwasser, Felix	44
Sumner, Lowell	40
Svihla, Arthur	56
Sviridenko, P. A.	43
Swink, F. Nelson, Jr.	48
Syroechkovskii, E. E.	45
Tackle, David	30
Tanner, Wilmer W.	74
Taylor, Dale L.	53
Teal, John H., Jr.	50
Teploff, V. P.	68
Thompson, H. R.	6
Thorne, Robert F.	8,25
Tiemeier, Otto W.	38
Tierkel, Ernest S.	19
Tomilin, A. G.	56
Tomkins, Ivan R.	59
Trautman, Carl	62
Trimble, Otis M.	25
Trotter, R. H.	50
Trueblood, M. S.	51
Trumbo, H. A.	33
Turner, Frederick B.	75
Tyndale-Biscoe, C. H.	40
Udall, R. H.	26
Ustinov, V. I.	51
van Wijngaarden, A.	43
Varley, G. C.	14
Verheyen, R.	58
Vest, E. Dean	36
Videsott, R.	43
Vivian, Vincent Eugene	5
Volpe, E. Peter	75
von St.-Paul, U.	58
Wagner, H. O.	58
Ward, A. Lorin	41
Ward, Claud M.	36
Ward, Richard T.	8
Weaver, Harold	28
Webb, F. E.	14
Weidmann, U.	68
Weller, Milton W.	64
West, George Curtiss	58
Westerskov, Kaj	62
Wetmore, C. M.	15
Whelen, Townsend	17
White, E. M.	4
Wilcox, LeRoy	69
Wilhoft, Daniel C.	72
Wilimovsky, Norman J.	75
Wilke, Ford	56
Williams, Roger M.	44
Wilson, H. Lee	64
Wing, Leonard W.	69
Wingard, Robert G.	52
Winner, Robert W.	68
Wolden, B. O.	8
Wood, A. J.	44
Woodgerd, Wes	64
Wright, Charles W.	30
Yamaguti, Satyu	14
Yamashkō, P. A.	51
Yeager, L. E.	26
Youatt, W. G.	47
Younger, Roy R.	25
Zeller, P. J. A.	24
Zweifel, Richard G.	75

Manuscript for WILDLIFE REVIEW 96 was completed August 13,1959.